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RELATION OF LABORATORY AIDS TO THE PRACTICE OF MEDICINE AND SURGERY*

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To one, like myself, whose clinical life has stretched over a period well beyond thirty years, there is the constant inclination to compare the practice of medicine as it exists today with that as it existed when he began his work. One of the infallible signs of advancing years is the tendency to meditate on the changes that have taken place within one's personal experience. And to the physician who now has reached that meditative period, surely one of the most impressive facts in the evolution of the practice of medicine, as he has seen it, must be the tremendous growth of the laboratory side of medicine and the vast importance which these laboratory and instrumental aids have come to play in diagnosis and treatment.

When, in the summer of 1890, I entered the New York Hospital as an intern, the routine analysis of the urine and an occasional hemoglobin test constituted almost the only laboratory work entrusted to the house staff. Clinical bacteriology was still in its infancy, and even the staining and search of the sputum for tubercle bacilli was looked on as a procedure so complicated and technical as to require the services of the hospital pathologist. The first clumsy and halting efforts at counting blood cells were made during my period of internship. Except for those few simple tests and the occasional use of the stomach tube and the Dudgeon sphygmograph, the recognition of disease rested entirely on a study of the patient's history, the symptoms and the physical signs.

DEVELOPMENT OF LABORATORY AIDS TO DIAGNOSIS

One has only to contrast the present situation with the one just described to realize how complete has been the transformation in our methods of studying clinical cases. The development of clinical bacteriology as applied to the study of the blood, the sputum, the urine, the feces, the secretions from the throat, ear and eye and the various body fluids; the elaborate staining methods for the study of blood morphology; the Widal and similar agglutination tests; the detailed study of the stomach contents; the elaborate chemical examinations of the urine, and more recently of the blood constituents; the use of the roentgen rays, the sphygomanometer, the polygraph, the electrocardiograph; the renal function tests; the Wassermann and other complement fixation tests; the dark field examination for spirochetes, and, more recently, the methods of gas analysis; the basal metabolism rate test; the Meltzer-Lyon test, and the skin tests for hypersensitiveness—all these and many others have come to aid us and, at times, to plague us by their conflicting evidence.

No one, of course, would venture to deny that this development of the laboratory side of medicine has contributed immeasurably to the enrichment of our knowledge of disease, and to our ability to recognize its less obvious forms; but the very wealth of such aids and their increasing complexity and elaborateness have brought in their train new complications and new difficulties.

This rapid increase in the number and in the complexity of the laboratory aids has been associated with a profound change in the character of the instruction given to our medical students. The work required in physiology, in biologic chemistry, in bacteriology and in immunology has increased by leaps and bounds because of the ever-growing application of these sciences to the clinical branches; and the additional time needed for these basic sciences has, to some extent at least, been taken from that formerly allotted to the more strictly clinical study of patients.

It was not to be expected that the increasing emphasis laid on these rapidly developing laboratory methods could fail to change in some degree the attitude of the student toward clinical medicine. The so-called "exact" methods of investigation seem much more important and much more satisfactory than the less tangible and less "exact" study of the patient himself and of the history of his illness. The making of a Widal test appears so much simpler and more convincing a method of establishing the diagnosis of typhoid than a painstaking analysis of the patient's history and a thorough physical exploration; the reading of a roentgenogram of the chest seems such a refreshingly short cut to the diagnosis of pulmonary tuberculosis; the electrocardiogram demonstrates so readily, and with such a saving of intellectual effort, the existence of, let us say, a two to one heart block, that it is not to be wondered at that most of our medical students and interns should now leave the hospital wards and go out as practitioners imbued with the feeling that all these laboratory and instrumental aids are a necessary and indispensable part of their professional equipment. They have come to lean on these more heavily than on the more strictly clinical methods of examination. This attitude on the part of the well trained young practitioner has been perhaps the most important single factor in deciding him to shun the rural districts and smaller towns in choosing the location for his practice. I have

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no desire to criticize him for this attitude; it is commendable rather than otherwise, but it constitutes a serious problem and deserves some consideration.

In the case of the older physician, who has never had the opportunity to work familiarly with all these laboratory methods, the situation is different but is no less embarrassing. By the fear lest he be looked on as not keeping abreast of medical progress, as well as by the inherent difficulties of diagnosis, he is faced with the necessity of employing tests of which he knows, only in a general way, the significance. Such knowledge as he has has been gained only in some indirect way. The long continued personal experience in performing the tests is lacking, and with it is lacking also an appreciation of the many possibilities for error both in the tests themselves and in their interpretation at the bedside. For all such knowledge he is forced to depend wholly on the competence and judgment of the laboratory man.

The widespread and insistent demand, even from the smaller places, for such laboratory aids, and the increasing tendency among practitioners to refer even the simplest examinations to the professional clinical pathologist, have called into being an immense number of commercial laboratories of varying degrees of competence and trustworthiness. It is rare indeed that such a laboratory is qualified to perform *all* the various procedures that are demanded of it. Modern bacteriology, chemistry, immunology and morphologic microscopy each requires highly specialized and thoroughly trained workers for the proper performance of its tests, and few such laboratories are so equipped in personnel. The result, not infrequently, is that the information furnished the physician is inaccurate and misleading.

Not long ago I was called out of town to consult with two local physicians over a middle aged woman whose case seemed to them puzzling because the clinical facts and the laboratory facts did not agree. The patient had the appearance of advanced pernicious anemia, but that diagnosis had not been made because the laboratory report had shown the blood to be only slightly below the normal figures. The clinical evidence of pernicious anemia was overwhelming, and it was quite obvious that that diagnosis must be made in spite of the blood report. Later a reexamination of the blood by a different man gave results that corresponded perfectly with that diagnosis. Similar instances of the embarrassment caused by inaccurate laboratory data could readily be cited in connection with almost every sort of laboratory or instrumental test. It is in hospitals of the highest class, in which the laboratory work is done under the most favorable conditions possible, that the fallibility of many of these more complicated tests is most keenly appreciated and most seriously taken into account.

The problem is no less pressing and difficult from the standpoint of the patient. Many, indeed most, of the newer tests are complicated and time consuming and require expensive apparatus and highly trained technicians. They are therefore necessarily expensive; and, when many of these tests are required, the matter of expense becomes a serious one to patients in moderate circumstances.

I have said that the rapid increase in the number of laboratory aids and the growing reliance on these in diagnosis have tended to divert the attention of the practitioner from the older and more arduous methods of clinical diagnosis, and, as a natural result, less importance has come to be placed on accurate clinical observation and sound deductive reasoning. It may be stated as a general rule which has few exceptions that the less thoroughly a case is studied by ordinary clinical methods the greater will appear the need for laboratory tests of the more elaborate sort. Such tests, however, can never take the place of clinical study and clinical judgment. At best they can only furnish some additional evidence which must be weighed and considered in connection with all the other facts obtainable; and when, as sometimes happens, this evidence runs counter to the clinical facts, the difficulties of diagnosis may be increased rather than lessened by it.

Enough has been said, I think, to show that this question of the relation of laboratory aids to the practice of medicine and surgery presents a problem of many aspects and one beset with many difficulties. Can we hope to find a solution for all or any of its difficulties?

IMPORTANCE OF RESULTS, RATHER THAN METHODS

I should regret very much to give the impression that I look on these laboratory aids as undesirable or unnecessary. On the contrary, it must be clear to every one that it is only by their help that modern clinical medicine and surgery have made, and will continue to make, their chief advances. But I am convinced that the indiscriminate application of many of the more complicated and delicate of these procedures to the individual problems of the practitioner is not necessary and will often serve to confuse rather than to clarify the issue.

The special field for such tests lies in their application to the problems of clinical research, as these are carried on in thoroughly equipped hospitals, manned by highly trained and carefully chosen workers. Under such circumstances these tests are invaluable in bringing to light new clinical features or in making more understandable those already known.

It is the results of such research, in terms of new or better understood clinical facts, rather than the methods themselves, that should be passed on to the general practitioner. The study of the various disorders of the heart beat by means of the polygraph and the electrocardiograph, for example, has added enormously to our understanding of these conditions, and by use of these instruments the clinical features and the significance of these disturbances have become thoroughly understood; so that now for the properly trained physician, their recognition by their clinical features alone usually presents no difficulties. For the every-day practitioner, the time spent in a careful study of Sir Thomas Lewis' little book, "The Clinical Disorders of the Heart Beat," will be much more usefully employed than in any attempt to master the technical and interpretative intricacies of either of these instruments, and will make such instrumental examination quite unnecessary except in very occasional instances. Again, the use of the various renal function tests and the quantitative study of the nitrogen constituents of the blood have served to confirm and harden our slowly developing clinical consciousness that there are fundamental differences between chronic interstitial nephritis and the condition commonly known as essential arterial hypertension. But the physician of today does not need the aid of these complicated tests in order to make the differential diag-

nosis; the distinguishing clinical features have become so well known, the lineaments of each have grown so clear-cut and sharp, that the distinction by clinical means alone is now rarely difficult.

It is easier to point out the difficulties and defects of the situation as it exists at present than to offer definite suggestions for overcoming these. The chief fault, however, lies, I think, with the medical schools and teaching hospitals in failing to appreciate the need of training those students who expect to go out as general practitioners to place their chief reliance on the clinical facts and to use discrimination and economy in the employment of laboratory tests. Such students should, for example, be made to realize that in the diagnosis of late syphilis the meticulous search of the body for the well-known stigmas of tertiary syphilis may yield information much more trustworthy and decisive than that obtained from a Wassermann test. They should be instructed in the limitations, the varying significance and the sources of error of many of these tests and in the need of sufficient moral courage to reject such data when they are in conflict with obvious clinical facts. They should be taught that the mere careful inspection of a specimen of urine, sputum or feces may at times give one more useful information than an elaborate chemical or bacteriologic examination. They should be made to understand that many of the newer and more complicated tests have not yet proved their permanent value as diagnostic aids.

When one compares the methods in use at present with those in vogue ten or fifteen years ago, one realizes how ephemeral has been the life of some of them. Such procedures as the opsonic index, the Abderhalden test, the Cammidge reaction, Ambard's coefficient and the McLean index, the nitrogen partition of the urine are now rarely mentioned. Some of these have failed to prove their value; others have been replaced by simpler and better methods.

It is perhaps too much to hope that the average practitioner will himself perform all the simpler, routine laboratory tests that he requires, although there is much to be said in favor of that plan; but when thoroughly trustworthy clinical laboratories are not available, these essential tests should at least be made under his personal supervision.

The dependence of such a large part of the profession on commercial clinical laboratories brings up the question as to whether these should not, in some way, be required to conform to certain minimum standards of accuracy. Already in some states, as in New York, the state department of health requires that certain tests having important relations to the public health, such as throat cultures for diphtheria and the Wassermann test, shall be made only in such laboratories as have demonstrated their fitness for such work and have been approved.

It may be that the problem of adequate and reliable diagnostic laboratory service for the smaller communities will be solved by the extension of the health department laboratory service into such communities in cooperation with local hospitals or community health centers.

My plea then is:

For greater attention on the part of teachers to the need of establishing in the minds of students a truer perspective of the proper relationship between laboratory aids and the older bedside methods of clinical study, and an appreciation of the importance of acquiring skill in the latter methods.

For a sense of greater responsibility on the part of the general practitioner for the trustworthiness and accuracy of the tests employed by him and for a proper understanding of the principles, the significance and the limitations of application of such tests.

For an effort on the part of all of us to resist and counteract the growing inclination to regard the use of laboratory and instrumental aids as the chief means of diagnosis and to give too little weight to the more laborious but more important measures of painstaking clinical observation and careful deductive reasoning.

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RECURRENCES IN CANCERS OF THE BREAST *

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OMAHA

In the light of today it would be supererogation on my part to recapitulate the end-results of the operative treatment of cancer of the breast as reported by many clinics and individual operators throughout the world. The results in the main are about the same, and the technic employed in general varies so little that claims of superiority in end-results on that score are hardly worthy of serious consideration.

A clearly operable cancer of the breast which recurs locally indicates that either the technic was incomplete or else that its lymphatic extension had passed beyond the limits of the field of operation, however well the operation was performed. Again, in an instance of metastatic recurrence, if a pathologic study of the specimen removed fails to detect cancer elements beyond the border of the parts removed, then metastasis had already taken place before the operation was performed.

The most important thing we know in the treatment of cancer of the breast is its early removal (probably Handley's technic is preferable), before lymphatic involvement can be detected; this gives the largest percentage of cures—about 70. When the axillary glands are only slightly involved, the supraclavicular glands not involved, and no metastases discernible clinically or by means of roentgenograms, about 33 per cent. of cures can be expected. The average case with axillary glandular involvement, none other being discernible, gives about 10 per cent. of cures. In advanced cases in which radical palliative operation is done there is an occasional cure—about 5 per cent. These percentages are those of Greenough and Simmons, and are in agreement with my experiences and those of my colleagues in our locality of the Central West. The roentgen rays, properly applied to a foul-smelling cancerous mass, will destroy the disagreeable, frequently very offensive odor in from twenty-four to forty-eight hours.

Very late metastasis or what may be termed secondary cancer occurs. I have had one case of this kind, in the liver, twenty years after the removal of a cancerous breast.

Those of us who accept Handley's permeation theory of the routes of lymphatic dissemination believe that we see for the future a lowered local recurrence in can-

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

cer of the breast, and a necessarily lowered invasion of the cavities of the body. We also see how we may best employ irradiation to delay or prevent recurrences: briefly, a wider fascial removal, and a more systematic employment of irradiation in a circumferential manner, in a wide extension along the route of the lymphatics draining the area of the breast in which the tumor was located. An important study of factors which influence longevity in cancer was made by McCarthy,[1] basing his study on the fact that, following operations in very extensive cases of cancer, these patients sometimes live much longer than others with easily removable small growths. Among the 293 cases studied, there were ninety-two of cancer of the breast, all of which patients had died either of recurrence or metastasis following radical operation. The findings of the study showed that when "fibrosis is present in association with cancer of the breast, the postoperative life is increased 34 per cent. When hyalinization is present in association with cancer of the breast, the postoperative life is increased 40 per cent. When the two factors—fibrosis and hyalinization—are present in combination or association with cancer of the breast, the postoperative length of life is increased over 56 per cent."

Irradiation of cancer in accessible locations, if a sufficient dose is given, results in a destruction of the pathologic cells and their replacement by fibrosis; it also results in hyalinization, both conditions inhibitive of the extension of cancer: hence the employment of irradiation before operation and as a postoperative measure is rational.

Before modern pathology and bacteriology became the dominating influences in the study of disease, it was a generally accepted theory from time immemorial that there was a predisposition to cancer in certain families. So great has become this influence, and so authoritative has become the effect, that practically all of our textbooks on pathology deny the inheritability of cancer. It has been allowed to go out in the propaganda literature of our great, praiseworthy Society for the Control of Cancer, that "cancer is not hereditary."

Students of biology are teaching us in a way that does not admit of contradiction, that we inherit from our forebears all of their physical and mental make-up, each in such concentrated or diluted form as may be best explained to date by a law of heredity—the mendelian—applicable to all vertebrates, in truth, to every living thing, animal or vegetable.

About fourteen years ago I read a paper before the Medical Society of the Missouri Valley in which I tried to maintain the position that cancer was a constitutional disease, i. e., that there was an inheritable predisposition. The same arguments that were presented then hold good today, only more so, because the teachings of biology strongly maintain it. The biometricians, or school of the ancestrians, most ably represented by Professor Pearson, do not accept the mendelian explanations of heredity, but it appears to me that the latter's most ardent advocates, Professor Bateson,[2] Mr. Mudge and others, have the better of the argument in that the mendelian school explains the occurrence of mutations as in line with recessions; whereas, the biometric theory of continued variations is blocked by these occurrences. As Mr. Mudge says, the mendelian school has been in existence only a comparatively few years yet in following its teachings practical results have developed. He mentions wheat, saying that the agriculturist sought in one plant the characters of resistance to rust, large ears, strength of quality, and capacity to ripen early. It is now possible by appropriate crossing, to obtain a stable race. The same principles are of practical application in the breeding of animals, and in the growing of new varieties of fruits and flowers, as Burbank has demonstrated in California.

If this is all true, and it is, why, in man, may we not explain certain changes in congenital rests? The formation of congenital cells favorable to undergo malignant degeneration is irregular, and can follow no direct law because of the entire absence of system in crossing human beings. We know that these congenital formations frequently are the starting points of malignancy. How may we explain favorite sites of malignancy when only chronic irritation is at work—the lip, the tongue, the pylorus, the cecum, the sigmoid and the rectum? There is no difference in the occurrence of cancer in men and women except as explained by the organs of sex and their chronic irritations and exposures to trauma. The other apparent differences in each sex are the result of habits and customs of nationalities.

A vital change in the biologic properties of cells giving origin to tumors must take place to inaugurate their growth. What the nature of this change is we do not know with certainty.

This is not the place to attempt to discuss the cancer problem except in a way in which I think its biologic study may point toward a better knowledge of the study of the prognosis of cancer, and more particularly of cancer of the breast, which can be felt and too often seen.

Too few pathologists, and especially too few surgeons and anatomists, give sufficient heed to the fact that men's viscera and other organs differ from one another in size, position and relation, in a degree as do their faces, no two being exactly alike; this is less true in twins and in those of strong familial likeness in face and form. As each one's cells differ from another's proportionately as do their grosser tissues, this may explain many of the hardly explicable numerous classifications of tumors which tend to confuse rather than elucidate.

My belief in the inheritability of cancer and its applicability to the study of its pathology has been intensified of late years by the work of the biologists, particularly the work of Maude Slye. This work has brought about the belief that its results may be applied in eugenics so as, in the future, to lessen the death rate from cancer. Miss Slye, in experimenting with mice, developed in her laboratory two strains; one cancer-free, i. e., one in which no case of cancer had developed in twelve years among many thousands of mice, in generations in number which would correspond to about 2,000 years of human life as measured by generations. There can be no Methuselah pathologists who might study the biologic problems of heredity in man; hence we must employ in this study short-lived mammals with organs like our own, presenting similar pathologic changes. Miss Slye, during the same time, developed also a strain of cancer mice in which, either by inbreeding or crossing, she was able not only to breed cancer at will, but also in such organs as desired, viz., the breast, lungs or liver; to breed sarcoma or carcinoma-sarcoma. She could, by crossing the cancer strain with the noncancer strain, develop cancer in certain proportions, dominant or recessive, and by crossing

1. McCarthy: Collected Papers of the Mayor Clinic 1921.
2. Bateson: Heredity and Disease, New York, Longmans, Green & Co.

these again and again with the noncancer strain, breed out, so to speak, the cancer element. All of this work was done in direct accordance with the laws of heredity as expressed in the mendelian theory. In the cancer strain, cancer is dominant; in the mixed strain, it is recessive, the attenuation of the recession being in a proportion relatively attenuated as the breeding-out process is carried on in conformity with the mendelian law. So in man cancer is recessive, and the hereditary tendency is as true in certain families. In the human race in general, the noncancer tendency is dominant, and the disease appears only when recessive elements blend in matings. Therefore in families in which cancer has been known to have occurred several times, particularly if in its occurrence it has most often had an especial affinity for any particular organ, say the breast, it should be traditional, more particularly if in matings cancer is recessive on both sides, that the teachings of the Society for the Control of Cancer should be kept in mind, not in any sense to cause unhappiness, but to give a feeling of safety.

In the paper referred to, published fourteen years ago, I illustrated what may be understood by recession by giving the history of a family of eleven children—six albinos and five ordinary relatively dark persons—in which the parents had no knowledge of albinism in their ancestry. Both the parents had dark hair and blue eyes. The father had two sisters that were albinos, each of whom had children with dark hair and blue eyes. I followed the history of this family for thirty years; there are now many grandchildren, some married, and as yet no albino has been born. Here albinism is recessive, nonalbinism is dominant. Should members of this family intermarry, or marry into a family in which albinism is recessive, an albino progeny may be expected. Such is my conception of heredity in cancer. It is intensified by the experimental work of Miss Slye.

Recurrence of cancer after a radical, thorough operation depends on whether it is dominant or recessive; that is, the degree; and hence the expectation of late or early recurrence. Cancer, as before stated, in the human race is recessive; the noncancerous tendency is dominant. Fibrosis and hyalinization of the tissues of a recurrent cancerous breast tumor indicate that in that particular individual the noncancerous tendency is relatively dominant: hence a favorable prognosis. Both are indexes of the necessities, extent and numbers of irradiations as aids to nonrecurrence.

Cancer can unquestionably be induced in animals by continued local irritation; this occurs only in an unknown percentage of animals experimented on, as in man the same exciting irritation causes cancer in only a few in number of those subjected to the same irritation.

Whatever the cancer element or infective germ may be, there must be an inheritable predisposition, a fertile soil for the determination of the process, whether the local irritant is activated on the lower animal or on man. The propaganda of the Society for the Control of Cancer is bringing many cases of tumor earlier to the attention of the surgeon, particularly tumors of the breast. As a result there is surely a more hopeful outlook as to the cure of a greater number of cases of cancer of the breast.

I cannot agree with Miss Slye that, cancer in mice having been proved hereditary—and by analogy inheritable in man—it follows that cancer cannot be a germ disease. From my point of view as a clinician, I do not see her logic. The often great difficulty of differentiation between cancer and syphilis, cancer and tuberculosis, say of the tongue, tonsil or larynx, is such as to call for the keenest of talent. That cancer growth and metastasis do not follow the laws of bacteriologic infections is no reason that it may not have its own law, as have others which we acknowledge but as yet cannot identify.

The day is coming when a cure for cancer will be discovered. It seems that this will happen only when we give up our present theories of its pathology, absolutely hopeless to date, become better students of biology and chemistry, and further seek the problem in a more rational analysis of its relation to the germ theory of disease.

THE DIAGNOSIS OF EARLY BREAST TUMORS

BASED ON THE CLINICAL HISTORY AND PATHOLOGY AT THE EXPLORATORY INCISION *

JOSEPH COLT BLOODGOOD, M.D.
BALTIMORE

There are two types of research: One seeks for the unknown irrespective of the needs of the people. The other is a research for the practical and pressing needs of the people today.

When we study our 33,000 histories of patients recorded in the Surgical Pathological Laboratory of the Johns Hopkins Hospital since 1890 and search for the chief controllable factor in our failure to cure, it is the duration of the disease known to the patient and recorded by the answers to the questions: How long have you been ill? How long have you felt the lump?

Today, therefore, the chief hope of increasing the number of cures of cancer is the shortening of the duration of the disease. Apparently this can be accomplished only by the education of the public—giving them correct information.

If the lump felt by the patient proves to be cancer, its duration is the only controllable factor in the ultimate cure. If the lump felt by the patient is not cancer, it remains curable no matter how long its duration, and becomes dangerous only when it changes into cancer. Its removal, therefore, is protection from cancer.

When we select among our breast tumors only those which, on restudy of the tissue or section, are without doubt carcinoma, and place them into groups according to the duration of the lump as recorded in the original history by the answer to the question, How long have you felt this lump? we find that the largest percentage of five-year cures and the smallest percentage of recurrences after five years are in the group in which the known duration of the lump was one month or less. The percentage of five-year cures gradually falls, and the percentage of recurrences after five years gradually rises with each additional two-month period of time, up to three years. This statistical study has been repeated again and again for confirmation, with the conclusion that at present the only controllable factor for the cure of cancer of the breast is the duration of the lump.

BENIGN LUMPS DIAGNOSED CANCER OR SUSPICIOUS OF CANCER

During these thirty-three years, and especially during the last ten years, this group has been observed and

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

recorded in the laboratory with increasing frequency. Many of these cases have been referred to the laboratory by surgeons and pathologists from all parts of the country, chiefly because their malignancy has been questioned.

In this group are found breasts the seat of chronic cystic mastitis with or without a blue-domed cyst in which one or more areas have been looked on as carcinoma or suspicious of carcinoma; chronic mastitis in the lactating breast without abscess formation which have been diagnosed adenocarcinoma or suspicious of carcinoma; and nonencapsulated areas in the breast without abscess formation or caseation which, microscopically, show undoubtedly tuberculosis, but in which parenchymatous changes and distortions have been interpreted as malignant. Then, there are numerous examples of distinctly encapsulated adenomas with a microscopic appearance suggestive of cancer. In more than 50 per cent. of the single or multiple cysts with an intracystic papilloma, the first recorded microscopic diagnosis has been adenocarcinoma.

This group has become relatively large, and when classed with undoubted carcinoma produces a large element of error, increasing the percentage of five-year cures and making it impossible to estimate correctly the controllable factor in the cure of cancer.

This group of benign lumps in the breast diagnosed cancer or suspicious of cancer when gathered together shows two remarkable facts: First, in none do the glands of the axilla, when removed, show metastasis, and, second, when we record the ultimate results, in none has there been observed local recurrence irrespective of whether the operation has been the removal of the tumor, or of the breast, or the complete operation for cancer. Therefore they are grouped by themselves. All these patients remain well irrespective of the known duration of the lump. When this group is placed with undoubted cancer, it increases the percentage of five-year cures, decreases the percentage of local recurrence and late recurrences after five years, and makes for confusion in all statistical studies, so that the most important controllable factor for the cure of cancer—the known duration of the lump—is not evident.

As this element of error has been present in my own investigations for years, I feel justified in the conclusion that it is present in all other statistical studies throughout the world.

EFFECT OF EDUCATION ON THE CHARACTER OF BREAST LESION IN LARGE SURGICAL CLINICS

It is to be remembered that in the Johns Hopkins Hospital Surgical Clinic the duration of the lump in cancer of the breast has always been considered the most important factor in its cure. Dr. Halsted frequently spoke of this to his associates and to his patients and their physicians. Our first early cases of cancer of the breast came from those getting this correct information. At the American Medical Association session in 1910 in St. Louis I [1] emphasized that the most important factor in the cure of cancer, no matter what its locality, was the known duration of the symptoms or the lump, and to reduce this duration of the disease the profession and the public needed correct information. In 1913 there appeared articles in magazines by Samuel Hopkins Adams, the direct work of my associate Cullen of Baltimore and of his committee. Then followed the organization and educational efforts of the American Society for the Control of Cancer.

The effect of these educational efforts in regard to the character of lesions of the breast as observed in the records of the Surgical Pathological Laboratory of the Johns Hopkins Hospital seemed almost incredible. I published [2] them briefly in March, 1922.

At that time, since 1920, in about 50 per cent. of the women who were referred to the clinic because of some breast complaint, nothing serious was found on examination and no operation was performed. Of the remaining 50 per cent. in whom there was a definite lump, the lump proved to be cancer at operation in about one half. Therefore, of 100 women examined in the clinic for breast lesions, in only about 25 per cent. did the lump prove to be malignant.

Let us compare these figures with those of the first ten years—up to 1900—observed in the same clinic. Less than 1 per cent. were not subjected to operation; the remainder had definite lumps of a long duration known to the patient and, when subjected to operation, almost 85 per cent. were cancer.

I have also observed the good effects of this educational effort when I have given clinics throughout the country. In the majority of the cities, among the women with breast troubles brought in for diagnosis the lesion was benign.

NEW DIAGNOSTIC DIFFICULTIES

In my own experience there is no question as to these new difficulties, and if I may judge from the breast tissue sent to the laboratory for diagnosis and from correspondence and conversations with surgeons and pathologists throughout the country, all are experiencing the same difficulty, with increasing frequency. These diagnostic dilemmas are three:

1. The first difficulty is encountered in the examination of the breast: Has the patient a definite lump, or is it only part of a lumpy or shotty breast, or a benign, wormlike tumor beneath the nipple? What is the significance of pain in the breast, or a discharge from the nipple, when the examination of the breast reveals no definite lump. What shall we do for a slight wart or minute ulcer on the nipple, or for a recent red, granular, weeping nipple? What should be one's attitude for a visible and palpable mass in the axilla? How should we interpret definite multiple lumps in one or both breasts? What is the significance of intermittent retraction of the nipple and permanent retraction of the nipple? What does a unilateral enlargement of the breast mean?

The first decision, therefore, after the first examination and history is: Has the patient a definite lump, has anything been found which would indicate an exploratory operation?

Second, having found a definite lump in a woman over 20, should the complete operation for cancer be performed without an exploratory incision, or should the lump first be explored, and, if so, how?

2. The second difficulty is at the exploratory incision: Is the palpable lump that one now sees and feels benign or malignant? If one decides that it is benign, shall one be influenced in the extent of the operation by the appearances of the breast tissue cut through in exploring or removing this lump?

3. The third difficulty is the interpretation of the immediate frozen section. In spite of the best technic

1. Bloodgood, J. C.: Recent Progress in Surgical Treatment of Malignant Growths, J. A. M. A. 55:1537 (Oct. 29) 1910; The Surgical Treatment of Cutaneous Malignant Growths, ibid. 55:1615 (Nov. 5) 1910.

2. Bloodgood, J. C.: Benign Lesions of Female Breast for Which Operation Is Not Indicated, J. A. M. A. 78:859 (March 25) 1922.

in making these sections, and in spite of the fact that they are first examined by the most experienced in pathologic conditions of the breast, I have found that if these sections, or other permanent sections, are submitted to a number of men equally experienced in the microscopic diagnosis of breast lesions, there is an increasing number of cases in the group which I have just discussed under the heading of benign lumps, diagnosed cancer or suspicious of cancer.

When one submits sections of undoubted cancer of the breast to the same pathologists, there is never any difference of opinion as to the malignancy. When one submits distinctly benign encapsulated adenoma and distinctly benign chronic cystic mastitis and the other types of benign lesions of the breast to the same group of pathologists, there is rarely any difference of opinion as to the benignancy.

This borderline group, at least at the present time and as far as my personal observations go, is increasing.

When any one feels certain of his diagnosis in this borderline group, that certainty should disappear when he submits the sections to his colleagues and finds disagreement.

Therefore, we must face the facts that there will be increasing difficulties in the diagnosis of breast lesions, both at the examination and at the exploratory incision, and for this reason for the benefit of our patients, there must be a working rule.

WHAT TO DO IN CASE OF DOUBT

No one disagrees as to the necessity of the immediate complete operation for cancer, if the clinical, gross or frozen-section diagnosis is undoubtedly cancer, and I have taken the position that when the surgeon, with or without the aid of the pathologist, has any doubt as to the nature of the breast lesion, he should immediately perform the complete operation for cancer. The element of error will be relatively small, and it is far better to sacrifice the breast in a case of doubt than run the increasing risk of death by the incomplete operation for cancer (which is certain death), or an operation in stages (which greatly decreases the chances of a permanent cure). I [3] have discussed this position in detail in an article on chronic cystic mastitis.

WHAT TO DO FOR A DISTINCTLY BENIGN LESION

My experience teaches me that if the lump is distinctly benign, its removal is sufficient. The patient then runs no more risk of cancer than any other woman at the same age who has no evident trouble in the breast. There is evidence to suggest that the removal of a distinctly encapsulated adenoma is some protection against cancer, but the majority of cases of cancer do not give a history of a lump of sufficiently long duration to conclude that cancer frequently begins in preexisting adenoma.

There is not sufficient evidence that the breast the seat of chronic cystic mastitis is any more likely later to become the seat of carcinoma than any other breast. Therefore, when one explores and finds a distinctly benign lump, and the surrounding breast shows chronic cystic mastitis, there is no reason to remove the entire breast. This woman runs no more risk of cancer than one of the same age whose breast shows no evidence of chronic cystic mastitis.

3. Bloodgood, J. C.: Pathology of Chronic Cystic Mastitis of Female Breast, with Special Consideration of Blue-Domed Cyst, Arch. Surg. 3: 445 (Nov.) 1921.

REMOVAL OF BREAST

My evidence accumulated during these thirty years seems to show that removal of the breast is illogical—it is too much for a distinctly benign lesion, and not sufficient for carcinoma, or anything suspicious or doubtful of malignancy. There may be a few exceptions, but then the breast is not removed because of any question as to malignancy, but because the breast has practically been destroyed or made useless, uncomfortable or dangerous by the disease. This is true in diffuse mastitis with multiple abscesses and sinuses. The breast is removed because the infection threatens the patient's life or because the abscess formation has entirely destroyed it. Huge unilateral or bilateral hypertrophy may demand amputation of the breast. Cysts and encapsulated adenomas may reach such a size in ignorant women that there is no breast left to save. Tuberculosis of the breast with single or multiple abscesses and sinuses is no longer a lesion to be subjected to the complete excision of the breast. Patients with this form of tuberculosis usually recover, as do those with other forms, under rest treatment.

REMOVAL OF REMAINING BREAST WHEN PATIENT HAS HAD COMPLETE OPERATION FOR CANCER OF OTHER BREAST

Kilgore, who discussed this paper, has shown that a woman who has been operated on for an undoubted carcinoma of one breast runs at least 10 per cent. chances of developing later cancer of the remaining breast, while the ordinary woman of the same age runs from 1 to 2 per cent. chances. Therefore, it seems wise that this breast should immediately be removed if, at any future examination, even an indefinite lump is found. It is quite possible that, in the future, removal of the remaining breast may become a routine procedure a few weeks or a few months after the complete operation for a definite carcinoma has been performed on one breast and the pathologic diagnosis has been confirmed by restudy.

The necessity for the removal of the remaining breast if the patient becomes pregnant is far more urgent, as brought out by Trout of Roanoke in his paper before the Southern Surgical Association, and as confirmed by Kilgore in his study of the material in the laboratory of the Johns Hopkins Hospital and in the Surgical Clinic of the University of California.

NEW METHOD OF EXAMINATION

With the increasing difficulties of diagnosis that have been mentioned, a better method of examination of the breasts becomes necessary. I have already discussed this.[4] In the first place, it seems essential that the one who is to examine the patient's breast should have no hint as to the patient's complaint or which breast is involved. This is due to the frequency of the lumpy breast, only one of which lumps the patient has felt. If the examiner is told just where this lump is, suggestion may influence him to feel this lump more definitely and overlook the other lumps in both breasts. Repeatedly I have emphasized this to myself. Both breasts have been carefully palpated; both contained many indefinite lumps; finally one is picked out as the most definite, and then the patient is asked to place her finger on the lump she has felt. The examiner is surprised that the lump he feels is not the lump the patient indicates.

4. Bloodgood, J. C.: Boston M. & S. J. 187: 243 (Aug. 17) 1922.

Position of Patient.—The patient should be stripped to the waist with the clothes about the abdomen loose to allow palpation of the liver and spleen; she should recline on the back on a couch or examining table, the chest and head slightly elevated on pillows, the arms above the head, the fingers clasped. The patient has been warned not to tell the examiner anything, or to move the hands in any way to indicate which breast is the seat of trouble.

Inspection.—The table or couch should be so situated that the examiner can inspect the breast from all directions and move from side to side around the head of the table. He should look at the nipples for minute warts, red granular areas, signs of dry discharge, and retraction of the nipple. One should remember that one nipple may appear pulled in and the other be prominent; suddenly the pulled in nipple becomes prominent. Touching it will make it prominent if it is not an acquired or congenitally retracted nipple. The inexperienced, and even the experienced, may overlook definite conditions of the nipple. In one instance, after a most thorough investigation, I said to the young patient: "I can see or feel nothing wrong in your breast." She answered: "There is a small wart on my right nipple." I had overlooked it. A recent study of Paget's disease has shown that a wart or keratosis of the nipple may be the beginning of a later Paget cancer. Soap, water and petrolatum will usually remove such a wart.

The varying appearances of the areola, except the visible lump or dimpled area, have apparently no diagnostic importance. The inspection reveals the symmetry and size of the breast. Symmetrical unilateral hypertrophy is, of itself, not a sign of any disease of the breast, except when due to a large tumor, and this is immediately recognized on palpation. Asymmetry suggests some definite trouble. A visible small tumor is usually malignant. The most important things that are revealed by inspection are retraction of the nipple, which must be confirmed by palpation and properly interpreted by the history; warts; red, granular areas; signs of nipple discharge which must be confirmed by history and palpation; definite dimpling of the skin which must be confirmed by palpation; the visible small tumor, which is very suggestive of malignancy, as mentioned before; changes in the color of the skin, which, when over the palpable mass, are late signs of cancer; early signs of a skin infection, and later signs of a mastitis. Then there is the visible mass in the axilla, in one or both, which in recent years I have seen frequently; this may feel like a normal breast without the nipple, and was formerly supposed to be a lipoma. We now know that it is usually aberrant breast tissue, and one should examine it and treat it as if it were a breast. If it contains a palpable tumor with every evidence of benignity, one should explore the tumor; if the tumor feels hard like cancer or has dimpling of the skin over it, one should perform the complete operation for cancer. Carcinoma may begin in this aberrant axillary breast tissue.

When this axillary mass feels like a normal breast or lipoma, it should be left alone.

Infection of the hair follicles or sweat glands in the axilla may give rise to single or multiple skin nodules, generally with redness of the skin. On palpation they are doughy. Nothing in the examination suggests malignancy, even if the glands in the axilla are enlarged. The best treatment is cleanliness, with incision of the abscess when it forms.

However, when these take place in the axillary skin after the complete operation for cancer, they may suggest skin recurrences and lead to an unnecessary deforming wide excision of this skin area or to roentgen-ray and radium treatment. The visible and palpable area is entirely different from metastatic skin carcinoma, and then again, from the standpoint of treatment, one can be quite certain that if these nodules were metastatic carcinoma, the condition would be hopeless.

The retraction of one breast against the chest wall is a very late sign of cancer. It also may be present in mastitis with abscess. A pendulous breast with unilateral hypertrophy, and a normal breast which is not pendulous, may give rise to the false impression that the smaller breast is retracted against the chest wall. One may see on the skin of the breast the scar of a previous operation or one due to the healing of a skin infection or mastitis abscess. One must learn to distinguish between the rare fibroma of the skin and the skin metastasis. The benign and malignant tumors of the skin common elsewhere are very infrequent in the skin area over the breast.

Palpation.—Except for lesions of the nipple and skin, this is the most important procedure in the examination. The palpation must be gentle. The greater the force, the less the perception of what the finger touches. First, one should feel both breasts, one with each hand, placing the fingers of each hand on corresponding areas of the two breasts. One should begin with the upper and outer quadrants, avoiding the nipple until last, because it is likely to produce congestion of the breast. In palpating, one should move the fingers up and down as if playing the piano. One is now searching for the multiple indefinite lumps and for the single definite lump. The palpation should be repeated. Then one breast should be felt with both hands, the examiner trying to pick up the breast along its outer hemisphere and feeling for an edge. As a rule, the breast periphery has no distinct margin. If one feels a distinct edge or margin, as in the liver or the spleen, it does not necessarily indicate disease, but a type of breast which I have described as a shotty breast. When one lifts up the edge of the breast, it may assume the shape of a saucer with the concavity toward the chest wall, and when one grasps this breast tissue between the fingers, one may feel many multiple, minute, shotlike masses. As a rule, this shotty breast is bilateral. The upper and outer quadrants are most frequently involved. However, the entirety of both breasts may feel alike. The greater the number of women who seek the advice of the clinic immediately after they experience any trouble with the breast, the more frequently will the lumpy or shotty breast be found on palpation.

Now the nipple area should be palpated. If one or both nipples have been retracted, this palpation may cause erection and exclude retraction of the nipple. One should feel especially beneath the nipple and areola for wormlike masses, usually bilateral, and quite distinct if present. During the palpation of these wormlike masses a secretion, usually brown and thick, may be expressed from the nipple.

The lumpy breast, the shotty breast, and the wormlike tumors beneath the nipple, I am confident, were frequently overlooked, when the patients came under our observation with a definite lump of long duration, usually with definite clinical signs of cancer, and they will be overlooked today unless the palpation of the breast is repeatedly and carefully made. If one over-

looks them, no harm follows to the patient; but if one feels them and does not know their benign significance, one may subject the patient to the unnecessary removal of one or both breasts or the complete operation for cancer.

When, on inspection, a unilateral retraction of the nipple is observed, and on palpation it remains retracted, and one can feel nothing else in the breast, only the history will allow one to interpret what this retraction means. If it is congenital, or has been present years since lactation or mastitis, it is not a sign of malignancy, nor does it furnish an indication for operative treatment. If it is distinctly of recent origin without a history of recent injury, lactation or mastitis, it should be looked on as a sign of malignancy, and the complete operation for cancer performed. The number of such cases under my observation is relatively small—less than fifteen. In about two thirds, a minute cancer nodule could be demonstrated in the breast; in the remaining cases, no cancer, but benign chronic cystic mastitis or a minute papillomatous cyst. To explore such a breast in which there is retraction of the nipple only might fail to reveal the lesion. From my experience the complete operation is the safer procedure.

Palpation of a Definite Single Lump.—As I read over my records again and again, the remarkable fact stands out that we have rarely palpated a distinct lump which the patient had not felt.

This evidence is most encouraging. We do not need to educate women how to feel a definite lump, but to influence them to come for an examination the moment they feel a lump. As a corollary, rarely does the careful palpation fail to find a definite lump the patient herself has located. In the few instances in which I have overlooked the lump which I could feel after the patient had located it for me, this lump has always been small and, when explored, either a benign cyst or an encapsulated adenoma.

Having found a definite single lump, one must repeatedly and gently, on more than one occasion, try to get its exact outlines and density. Not always, but frequently, a cancer can be recognized on palpation alone. The difficulties of interpretation are increased when the malignant tumor is buried in breast tissue, or when the breast itself is unusually large and fatty.

Having finished palpation for the lump, one should feel for atrophy of the skin over the lump, or slight fixation of the skin. When this is present, especially with small tumors, malignancy should be suspected. The breast containing a lump should be pushed forward to bring out dimpling—this is an almost certain sign of cancer. If the nipple is not definitely retracted, one may bring out slight fixation of the nipple by placing the fingers of one hand on the lump and pulling the nipple. If the nipple is fixed, and especially if the lump moves a bit, this is almost a positive sign of cancer. The slightest evidence of edema about a palpable lump is very suspicious of malignancy, except about areas of definite inflammation. When the lump seems fixed in the breast, or the breast about it is slightly infiltrated, cancer may be expected. On the other hand, when the lump is freely movable, especially when it feels spherical and tense like a marble, this is very suggestive that it is benign.

It is a very good plan to repeat palpation on the operating table before the area is cleaned, and then again with the gloved hand after the area is prepared for the incision. This is essential when one's first conclusions are that the lump is benign. The greater one's experience, the better one's memory of the lumps one has explored; and the more certain the pathologic findings and records of these lumps are, the less frequently will a cancer lump be explored.

Palpation of Multiple Definite Lumps.—I have gone over our records again and again, and so far find no exception to this fact: When one palpates more than one lump in one breast, or lumps in two breasts, or multiple lumps in both breasts, these tumors are either benign, or, if cancer, the condition is hopeless from an operative standpoint.

Clinical History.—Having finished inspection and palpation, one then takes the history and records it in a thorough and systematic manner. Unfortunately, except for a few features, the historical data are not particularly helpful in the differential diagnosis of what has been found by inspection and palpation. I have hopes, however, that a greater number of complete and correct histories, checked by accurate pathologic examinations in the operative cases and followed for years as to the result, may bring out more facts from the history which will be valuable in diagnosis.

OBSERVATIONS

Age.—My records fail to reveal a single example of cancer in a woman aged under 20, and only one in which the recorded age is under 25. This patient was a colored woman who looked older. The number of cases of cancer of the breast between 25 and 30 is relatively small. Therefore I believe it safe to conclude that when the patient is 20 or under, cancer can be excluded. The relative frequency of benign and malignant lesions from the age of 25 upward varies. But the variation is insufficient to justify definite conclusions.

Pain.—Painful breasts are sufficiently common in women without cancer or any other lesion to exclude pain as an aid in diagnosis. This point has been repeatedly confirmed by the study of our records.

Duration of the Palpable Lump.—A known duration of three years or more with the tumor still definitely benign on palpation almost excludes cancer, but at any moment this lump may develop into a cancer. As women now come usually within one year after first feeling a lump, its duration will not be helpful in the diagnosis. It is important to remember that in some women the cancerous area in the breast is of very slow growth, and in many instances metastasis to the glands and internal metastasis may take place without any marked change in the known lump.

Discharge from the Nipple.—The interpretation of this clinical fact in the history varies. For years I have placed myself on record that it is no more helpful in the differential diagnosis when it is present without a palpable lump, than pain. As a matter of fact, if those authorities who believe that discharge from the nipple is a sign of cancer or of a precancerous lesion use the same arguments and conclusions for a similar study of pain in the breast, the evidence that pain in the breast is a sign of cancer or a precancerous lesion will be found to be greater than discharge from the nipple. From my records, the history of discharge, or the expression of something, from the nipple at the examination, present alone, is not an indication for operation, and such a patient runs no more risk of cancer than any other woman of the same age without such a history or finding.

Pregnancy.—Single palpable lumps in the breast during pregnancy in a woman over 20 years of age

should be subjected to the same examination and treatment as if pregnancy did not exist.

Lactation.—When a lump is felt in the breast at any time during lactation, and is a distinct single lump, the patient should be given the benefit for at least ten days to two weeks that the lump is a galactocele or an area of mastitis. If one or the other, it should disappear or form a definite abscess. If not, it should be explored. Cancer is not infrequent in the breast of the pregnant woman or during lactation. Dr. Kilgore of San Francisco will soon bring this out as based on his careful studies of a very large material of two clinics.

Trauma.—If there is a single definite lump which does not disappear within two or three weeks after a trauma, it should be explored. However, in all the cases that I have been able to observe, from the moment of the trauma there has first been a bruised area pictured by the discoloration of the skin, then an indefinite mass, and, as absorption goes on, multiple indefinite nodules which gradually disappear.

History of Mastitis With or Without Abscess.—When the area of mastitis entirely disappears and then, months or years later, a lump develops, this history is not helpful in the differentiation of malignancy from benignancy. But when the mastitis area leaves a lump known to the patient, cancer is very likely to develop, especially after years.

INTERPRETATION OF FINDINGS AT EXAMINATION AND FROM THE HISTORY

In the first place, we must remember that when a cancerous lump in the breast is subjected to the complete operation and the glands in the axilla are not involved, the chances of a five-year cure are at least 70 per cent. What the probabilities of a cure would be if all such lumps were of but one month's duration or less before operation I do not know, except that I believe that the chances of a cure would be better than 70 per cent. Therefore, we must have a working rule.

If one is in doubt whether the patient has a definite lump or not, it is best to explore and find out what the lump is; and if one is still in doubt, do the complete operation for cancer.

When the patient has a definite lump and one concludes, from the palpation of the lump, or because one has elicited atrophy of the fat, fixation of the skin, dimpling of the skin, or retraction or fixation of the nipple, that it is probably malignant, one should perform the complete operation for cancer without an exploratory incision, because the chances are very small that the lesion will prove to be benign. As one's experience grows, one may explore some of these lumps which have the early signs of cancer, but no surgeon should be criticized by the patient or profession for immediately performing, without exploration, the complete operation, when his careful clinical examination has revealed these early local signs of malignancy. Our records show that the most experienced surgeons have done this and yet, in a small percentage of cases, the pathologic examination has revealed a benign lesion. This is a mistake for the benefit of the patient which must still be made.

What influence will the palpation of a definite lump in a shotty breast, or a lumpy breast, or one containing the wormlike tumors beneath the nipple have on one's diagnosis? To one with less experience, no influence. Conclusions as to operation with or without exploration should be based on palpation of the lump and the presence or absence of the other early signs of cancer. To one of larger experience, exploration is justifiable if the signs of cancer are not very distinct, because my evidence, at least, indicates that cancer is less frequent in these types of breast.

The Early Signs of Cancer.—The most difficult to interpret is the palpation of the lump only. The next is that of the lump plus one other of the earlier signs—atrophy of the subcutaneous fat, slight fixation or dimpling of the skin, and definite retraction or fixation of the nipple. It is important to remember that the benign lesion is rarely associated with more than one of these definite signs. The more of the earlier signs of cancer that can be determined, the greater the chance of malignancy and the greater the justification of a complete operation without exploratory incision.

Exploratory Incision.—Having felt a definite lump, or being uncertain as to an indefinite lump, and having been unable to find any of the early signs of cancer, or being a little suspicious of the one early sign of cancer, one should explore the palpable area. It goes without question that this operation should be done in a hospital with the usual preparations for anesthesia, whether local or general, and with the patient prepared for the complete operation.

HOW SHALL WE EXPLORE?

There are two methods. If the lump is as large as, or larger than, a twenty-five cent piece, not deeply situated and not in a huge, fatty breast, one should cut slowly down on it, clamping all bleeding points. The tumor may be exposed directly beneath the subcutaneous fat, or one may have to cut through breast tissue to reveal the palpable area. When it is a small lump, deeply situated, or in a very large, fatty breast, the palpable area should be excised with a good margin of subcutaneous fat and breast tissue, and one should place in the wound an alcohol sponge, take the mass in the left hand and bisect it with the knife, study its gross pathology, and cut out a piece for frozen section.

When one explores the tumor by the first method and the exposed tissue suggests malignancy, one should examine it carefully, palpate it, cut out a small piece, swab the wound with pure phenol (carbolic acid) followed by alcohol, and then place in the wound a bit of gauze wet with a 50 per cent. solution of zinc chlorid. Then one should study the little piece cut out and have a frozen section made.

If one's conclusions are that it is a definite cancer, or suspicious of cancer, one should close the skin over the zinc chlorid gauze in the first method, and over the alcohol gauze in the second method, and proceed with the complete operation for cancer. If one's conclusions are that it is benign, one should remove the zinc chlorid gauze, excise the benign tumor with a margin of breast tissue, and close the wound; or, in the second method, remove the alcohol gauze and close the wound.

I have used the cautery for exploratory incision sufficiently to demonstrate that apparently it has no advantages over the methods described. It interferes with the rapid decision as to the nature of the tumor.

DIAGNOSIS AT THE EXPLORATORY INCISION

This article is a discussion of principles and fundamental facts based on continuous study of a large material over many years. There is not space in this report for details or illustrations. I must refer to my previous communications and others which are to appear in the *Archives of Surgery.*

The important points which I wish to emphasize are, that at the exploratory incision the tumors which are revealed can quickly be divided into three groups:

1. The distinctly benign—the blue-domed cyst and the encapsulated adenoma, the rare lipoma and the dermoid cyst.

2. The distinctly malignant—the common scirrhus and the less frequent medullary carcinoma, the less frequent colloid cancer, the very infrequent cancer cyst. These two groups of distinctly benign and distinctly malignant tumors have such characteristic gross appearances that the majority of surgeons and pathologists will recognize them. The frozen section will simply confirm the gross diagnosis.

3. The borderline tumor. These are solid, not encapsulated areas, with or without cysts and dilated ducts; some resemble the adenoma without its capsule; some are firm and gritty, not unlike cancer. One of the most difficult to differentiate is the cyst with a papilloma, especially when the papilloma completely fills the cyst. Depending on one's experience in interpreting microscopic sections, the number that one will recognize as benign or malignant from the frozen section will vary. In any event, there is a working rule—when in doubt, perform the complete operation for cancer.

I feel confident that, if these rules are followed, an incomplete operation for a malignant tumor of the breast will rarely, if ever, be performed. As one's experience with these borderline or early cases increases and as the surgeon and his pathologist become more and more familiar with the varying histologic changes, one will find that the number of complete operations for lesions not malignant will grow less.

It is important for all surgeons to remember and for the public to know that in the large clinics of this country and in many of the smaller where both the surgeon and the pathologist are experienced, this mistake of performing the complete operation for lesions that are not malignant takes place in a varying percentage of cases. Some of these clinics may be unaware of this. If so, their percentage of cures of cancer will be greater. But should they submit sections of this borderline group of tumors to their colleagues, they will find, as I and others have found, that the diagnosis of malignancy will not be subscribed to by a varying percentage of consultants.

WHAT THE PUBLIC SHOULD KNOW

In view of this evidence, it is my rule, and has been for some time, to inform the patient and the family that if at the exploratory operation there is any doubt as to malignancy, the safest procedure for the patient is to perform the complete operation for cancer.

PAGET'S DISEASE OF THE NIPPLE

In a recent study of thirty cases,[5] the following conclusions can be made: Paget's disease of the nipple in its early stages is preventable, and in the early stage of cancer largely curable if the complete operation for cancer is performed. There are several examples in the preventable stage, two of the red, finely granular nipple, and five of the type of small warts or keratosis of the nipple. In none of these seven cases was there ulceration, and the lesion disappeared after the daily use of hot soap and water, followed by protection with silver foil or petrolatum.

Then, there are seven cases microscopically benign which were subjected to operation. Three of these were distinct warts with minute ulcerations, two were red, finely granular nipples, and two presented the typical picture of Paget's disease with superficial ulceration and scab formation.

There were ten cases in which the ulcer of the nipple had not yet destroyed the nipple, but was microscopically cancer. In two cases the axillary glands showed metastases. This finding shows the importance of subjecting all cases of Paget's disease to the complete operation for cancer.

Then there were three cases in which the ulceration had destroyed the nipple, but there was no palpable mass in the breast. In one of these (33 per cent.) the axillary glands showed metastasis.

Finally, there are three examples of the late stage of Paget's disease. In all, the nipple was destroyed and replaced by an ulcer, and the breast contained a typical cancerous mass. None were cured by the complete operation.

In these thirty cases, the duration of the known disease is longest in the last group, in which there are no examples of a cure, and earliest in the first group, in which the lesion disappeared under simple treatment. All the earlier cases were in women who had been influenced to come under observation because of the educational campaign.[6]

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5. Soon to be published in the Archives of Surgery.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SUMMERS AND BLOODGOOD

DR. ALSON R. KILGORE, San Francisco: There is no location in the body in which cancer is more common and in which the prevention of cancer is more difficult than in the breast. Most breast cancers arise with no precancerous condition, but there are a few perfectly distinct precancerous conditions which we must train ourselves to recognize and to handle. One of these, the papillomatous cyst, with bloody discharge from the nipple, has been called to our attention today. Another is the residual scar from a lactation mastitis abscess. I am sure that we shall come shortly to recognize definitely certain other conditions in the breast which definitely tend to become cancer. If we can prevent patients who have had cancer either from having their cancers recur or from having new cancers form, we are just as surely practicing preventive medicine as we would be if we could prevent them from having cancer in the first place. Two years ago, at the meeting of this section in Boston, I reported a study of the cases in Dr. Bloodgood's laboratory which showed that patients who have had one breast removed for cancer and live five years or more are four times as likely to develop cancer in the second breast as are normal women of the same ages in either of their two normal breasts. Of all normal women in the community, 2 per cent. eventually die of breast cancer, whereas from 8 to 9.5 per cent. of women operated on for cancer in one breast develop cancer in the second breast if they live five or more years after the first operation. Perhaps we do not feel radical enough to remove the second breast in every case, but we can, at least, warn these patients of the danger they run and urge them to return for observation of the second breast. Since my report, Trout of Virginia compiled a large number of cases of women still in the child-

6. These references are given because they contain illustrations, and give the evidence in greater detail on which the conclusions in this paper were based.
The Pathology of Chronic Cystic Mastitis, Arch. Surg. **3**: 445 (Nov.) 1921. In this paper, many of the borderline lesions are described in detail, with illustrations.
Diagnosis of Early Breast Tumors Based on Their Clinical Picture or Their Gross and Microscopic Picture at the Exploratory Incision, Boston M. & S. J. **187**: 243 (Aug. 17) 1922. In this paper are given the illustrations of the distinctly benign and malignant lesions of the breast.
The Clinical Picture of the Diffuse Type of Chronic Cystic Mastitis (the Shotty Breast), South. M. J. **15**: 907 (Nov.) 1922.
The Clinical Picture of Dilated Ducts Beneath the Nipple Frequently to be Palpated as a Doughy, Wormlike Mass—The Varicocele Tumor of the Breast, Surg., Gynec. & Obst. **36**: 486 (April) 1923.

bearing period who had had breasts removed for cancer. Of these, 90 per cent. who subsequently became pregnant developed cancer in the second breast.

DR. L. P. MCCALLA, Boise, Idaho: Three points make for better conditions and lower mortality of cancer: (1) to see the patients early; (2) to make a correct diagnosis, and (3) to administer the right treatment. The problem is, How are we going to see these patients early? I am convinced that the best methods that have yet been brought out are along the line of those advocated by the American Society for the Control of Cancer. Its educational work has done a great deal of good throughout the United States. For instance, the local chairmen reported to me, as chairman for Idaho, that in seven small communities during National Cancer Week in 1922 they had seen 108 cases of early cancer. The total population of these seven districts would not exceed 30,000 people. If 108 cases came to these seven men, think of how many there should be throughout the whole United States with the efforts that are now being made to carry on this work in every community in the United States. The average surgeon is pretty well equipped to recognize the symptoms of early cancer, but the great majority of patients do not go to the surgeons first. Therefore, this education must also be carried to the physicians of the country, that they may be better prepared to recognize the early symptoms of cancer, that they may be able to suggest the right treatment. Of 114 patients who positively had cancer of the breast, 80 per cent. are living after seven years. I made a thorough operation in each case, and the results satisfy me that this is the right thing to do even in cases which, as Dr. Bloodgood says, there may be a reasonable doubt that it may be cancer.

DR. WILLIAM C. MACCARTY, Rochester, Minn.: I want to add my approval to what Dr. Summers said about the factor of heredity in cancer. I have studied from the standpoint of diagnostic efficiency 2,100 of 5,000 mammary pathologic conditions. Of this series, 78.5 per cent. came to operation with a positive clinical diagnosis. If in doubt as to the diagnosis, should we remove that many breasts in the hope that we will cure cancer? When a clinician suspects cancer of the breast, he puts his diagnosis down as malignancy with a question mark. How often is that condition cancer? In this series of 2,100 cases, 62.8 per cent. turned out to be cancer. Should we, when in doubt, do a radical operation? In benign conditions of the breast, when the clinician says it is benign, with a question mark, how many are benign? Eighty-eight and eight-tenths per cent. How many breast conditions can the surgeon or the expert gross pathologist diagnose grossly? In this series of 2,100 breasts, from 6 to 10 per cent. of necessity had to be diagnosed with the microscope and could not be diagnosed grossly by persons who are experts and experienced in gross and microscopic pathology. He who operates for a malignant diagnosis in the breast removes one breast out of every twenty unnecessarily. He who operates on a benign diagnosis in the breast fails to remove one out of ten when they should have been removed, and he who depends on his gross diagnosis at operation guesses in one out of every ten cases. These are the facts from a critical study of clinical and gross pathologic diagnosis. As to the woman under 20 being safe, not one is safe with a nodule in the breast. It makes no difference whether she is 1 year old. She should be treated just as though she were 75. Cancer of the breast occurs in young women sometimes. As to the blue dome cyst, I should like to have an opportunity to examine the specimen which Dr. Bloodgood showed as a blue dome cyst. All have seen specimens characterized as blue dome cysts, usually nothing but a large cyst frequently associated with small cysts if we study the rest of the breast. Three times I have seen a so-called blue dome cyst near which were small carcinomas. Whenever we see such a cyst, we advise removal of the rest of the gland-bearing portion of the breast because we have frequently found cancer in the rest of the breast.

DR. J. S. ROBMAN, Philadelphia: Dr. MacCarty gives me courage to sound a reactionary note in regard to this subject. I firmly believe that we should always keep in mind that any lump in the breast at any age does not belong there and is potentially a trouble maker. Of the cases that came to my father and myself, 40 per cent. have been carcinoma, 33 per cent. chronic cyst mastitis, 15 per cent. benign tumors and the rest scattered. Therefore, while I agree with Dr. Bloodgood that the benign lesions are becoming more frequently seen by the average surgeon than heretofore, as a result of the publicity that has been given to this matter in recent years, I still believe, so far as our experience goes at least, that carcinoma is the most common single lesion of the mammary gland. Further than that, in our experience 20 per cent. of the chronic cystic mastitis cases will unquestionably become cancer. One other fact has greatly impressed itself on my mind. Only 30 per cent., and that is an outside estimate, of carcinomas of the breast when they can be diagnosed with certainty clinically, can be saved. We can show in a very much smaller series of private cases than Dr. Bloodgood has compiled, 72 per cent. of three year cures and 50 per cent. of five year cures, but these include many cases of microseopic cancer. I cannot help, therefore, but feel that today the chief problem in the practice of mammary surgery is, as it has always been, the cure of cancer or, better still, the prevention of cancer. Unquestionably if we are always conscious of this thought, we shall occasionally remove a breast that should be left. This we should be careful of doing in women under 35; but if we must make a mistake and, being human, we will make them, I prefer doing a radical operation and leaving only a scar, thus doing too much rather than too little and have the patient die a hopeless cancer death.

DR. J. F. PERCY, Los Angeles: The diagnosis of a malignant growth in the breast, as has been emphasized, is exceedingly important, and I wish to urge as an additional measure of accuracy and safety the removal of the tissue, for a preliminary frozen section, with the cautery knife. In following this method we need have no fear of either stimulating or spreading cancer cells into new areas. The hot knife builds up a wall against any type of infection, certainly that of cancer; we do not have to limit ourselves to a small piece of tissue, and the wound will heal more perfectly than one made with the cold knife. To cut out a section of suspected malignant tissue by the usual technic and send it to the laboratory and leave the vessels and lymphatics open to take in the loosened and broken down cancer cell is an ill fated and dangerous thing for the patient. The advice is usually given to proceed with the operation as soon as the report of malignancy comes from the pathologist. The advice would be amusing if probable consequences to the victim were not likely to be so calamitous. To use the word "immediate" to describe an act that requires on an average fifteen minutes of time for its completion is, to say the least, a misnomer. The mischief is done immediately, but not the operation. Another interesting fact that I have learned in obtaining the histories of patients suffering from malignant growths is that they rarely have had an elevation of temperature exceeding 39 C. (102.2 F.) which persisted for more than ninety-six hours. This may prove to be an exceedingly important observation in its final relationship to the unraveling of the etiology of malignant growths.

Effect of Baths in Treatment of Shell Shock.—It is common knowledge that many of the internal organs have an automatic activity which can be altered in many ways by extrinsic stimuli acting through the vagus and sympathetic nerves; and the effects of climate and baths are partly or entirely due to such impressions. If an organ is deranged, these impressions will keep up the disordered action, and they are ably assisted in this harmful work by stimuli from other organs. During the war we treated cases of nervous and cardiac irritability resulting from shell shock and other causes by immersing the patient in a sedative pool bath, the temperature of which was that of the nerve endings in the skin. Sooner or later the symptoms disappeared, and it seemed as if vagus action were favored. Of course, other conditions assisted in promoting recovery, but I believe that the water cut off the varying impressions which play continuously on the cutaneous nerve endings.—C. F. Sonntag: *Proc. Roy. Soc. Med.* 16:8 (Aug.) 1923.

THE USE OF BASIC DIETS IN THE TREATMENT OF NEPHRITIS *

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The choice of a proper diet to use in the treatment of the various forms of nephritis, with and without arterial hypertension, is a debatable subject, and will continue to be one until the true etiologic factors, in all forms of these diseases, have been thoroughly established. Many and varied are the diet limitations that have been suggested, and, because of the ill effects of some of these restrictions, certain authors go so far as to maintain that the majority of patients would fare better if no diet instructions were given.

In the study of the types of food on which many of the arterial hypertension-nephritic group of patients have lived for long periods of time, we have been impressed with the observation that the acid-producing foods often predominate to a marked degree over the base-producing foods. Such observations, when carried further, lead us to believe that many other supposedly normal diets contain far too large a proportion of the acid foods.

Acidity in the body to the faintest degree is incompatible with life. We consume what foods we please, and the body preserves its slightly alkaline balance by secreting the excess of the acid ash by means of the kidneys. Urine acidities as great as 100 times that of the body are very common, and, occasionally, a urine is found which is 1,000 or more times as acid as the body. With our knowledge of the destructive action of very slight traces of acid on living tissue, we might be justified in assuming, theoretically, that abnormally acid dietaries may be a factor in the production of blood vessel and kidney diseases.

It seemed logical, therefore, in selecting an optimal, arterial hypertension-nephritic diet, to pay especial attention to the acid-base balance of the food selected. At the same time, other fundamental dietary principles were not neglected. The diets contained ample calories; adequate protein; sufficient bulk to insure daily, natural movements of the bowels; adequate mineral foods and an abundant supply of vitamins. The same types of diet are used by us in the treatment of all forms of nephritis, but our experience with their use only in the arterial hypertension group of cases is recorded in this paper.

Our first problem was to prove that by diet alone the urinary acidity could be reduced to any desired degree. Success marked these efforts, in every instance. We were then agreeably surprised to find that there was an appreciable improvement in the arterial-hypertension-nephritic symptoms, as evidenced by a fall in blood pressure, less shortness of breath on exertion, less dizziness, fewer headaches, and a decrease in the urine of both casts and albumin.

We then decided to use experimentally well balanced, basic diets and no other form of treatment in a series of the arterial-hypertension-nephritic group. Such patients were not kept in bed, but were permitted their usual activities. They were not starved. An attempt was made to maintain them at as close to their normal weight as possible. They were given no exhaustive hydrotherapy. They were given no vasodilator drugs. Cathartics were not used, since the bulk insured from one to three natural stools a day. Fluids were not limited. Sodium chlorid was restricted in a few terminal cases when the kidney function was very low. Patients were kept in the hospital from one to two weeks, where a series of palatable, sample meals were served and where they were given careful diet instructions. This hospitalization provided an opportunity for the study of continuous twenty-four-hour specimens of urine to ascertain whether the diets were sufficiently basic. The patients were given the outlines mentioned here.

THE CHEMICAL REACTION IN THE BODY OF SOME OF THE MORE COMMON FOODS

In the selection of a normal diet, more attention should be paid to the balancing of the acid foods by the alkaline foods. All foods may be classified, with respect to their final effect on the body, as neutral, acid or alkaline. Such lists of foods have been prepared by Sherman and Gettler [1] from ash analyses and tested in man by Blatherwick.[2] The accompanying tables have been prepared from their work.

TABLE 1.—*Acidity of Certain Foods*

	Per Hundred Grams
Bread, white	2.7
Bread, whole wheat	3.0
Corn, sweet, dried	5.95
Crackers	7.81
Cranberries	*
Eggs	11.10
Egg white	5.24
Egg yolk	26.69
Fish, haddock	16.67
Fish, pike	11.81
Meat, beef, lean	13.91
Meat, chicken	17.01
Meat, frog	10.36
Meat, pork, lean	11.87
Meat, rabbit	14.80
Meat, veal	13.52
Oysters	20.00
Oat, meal	12.93
Peanuts	3.9
Prunes, plums	*
Rice	8.1

* The ash of these foods is alkaline, but because of contained substances which form hippuric acid in the body, they increase the acidity of the urine.

Many diets contain far too large a proportion of the acid foods. This excess of acid is secreted by the kidneys in the form of abnormally acid urine. Such abnormally acid diets may be a factor in the production of kidney and blood vessel diseases.

The Neutral Foods.—These may be used in the amounts desired by the patient, unless otherwise stated. They are: butter, cornstarch, cream, lard, sugar and tapioca.

The Acid-Producing Foods.—Many of these foods should not be used. A few of the less acid ones may be used in the amounts specified for each case.

The total excess of acidity over base is expressed in terms of cubic centimeters of a normal solution.

The Base or Alkali-Producing Foods.—In general, all vegetables, nuts, fruits and sweet milk, with the exception of prunes, plums and cranberries, are basic

* From the Potter Metabolic Clinic of the Santa Barbara Cottage Hospital.

* Read before the joint meeting of the Section on Practice of Medicine, the Section on Pharmacology and Therapeutics and the Section on Pathology and Physiology at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

1. Sherman, H. C., and Gettler, A. O.: J. Biol. Chem. 11: 325, 1912.
2. Blatherwick, N. R.: The Specific Rôle of Foods in Relation to the Composition of the Urine, Arch. Int. Med. 14: 409 (Sept.) 1914.

in their final reaction. These may be used in the amounts desired by the patient. The total excess of base over acid is expressed in terms of cubic centimeters of a normal solution.

Teaching Notes.—1. A fruit served with cream is used as a substitute for a breakfast cereal.

2. Three half slices of toast may be served at breakfast, and bread omitted for dinner and supper.

3. Cornstrach is used as a thickener for cream sauce, soups, etc.

TABLE 2.—*Alkali-Producing Foods*

	Per Hundred Grams
Almonds	12.38
Apples	3.76*
Asparagus	.81
Bananas	5.56*
Beans, dried	23.87
Beans, lima, dried	41.65
Beets	10.86
Cabbage	4.34
Carrots	10.82
Cauliflower	5.33
Celery	7.78
Chestnuts	7.42
Currants, dried	5.97
Lemons	5.45
Lettuce	7.37
Milk, cow's	2.37
Muskmelon	7.47*
Oranges	5.61*
Peaches	5.04
Peas, dried	7.07
Potatoes	7.19*
Radishes	2.87
Raisins	23.68
Turnips	2.68

* These foods have been found experimentally to be very efficient in reducing the acidity of the body.

4. Lemon juice is substituted for vinegar in salad dressings.

5. Fat in the form of butter, cream, olive oil, etc., is used in sufficient quantities to regulate body weight.

6. The bulk of the diet is regulated to produce a normal bowel movement each day.

The routine hydrogen-ion concentrations were made on the twenty-four-hour specimens of urine by the simple colorimetric method described by Clark.[3] Hydrogen-ion concentrations of the blood were not made. They are too difficult for the average man to use, and we believe that the urine expresses the net result of the diet in a perfectly reliable manner.

A simple teaching interpretation of the logarithmic method of expressing the hydrogen-ion concentration (H) follows: The hydrogen-ion concentration of the normal blood is equal to the decimal fraction 0.00000004467. This is less than the hydrogen-ion concentration of distilled water, which is equal to the decimal fraction 0.0000001. Distilled water is neutral in its reaction. The blood, having a lower hydrogen-ion concentration than distilled water, is therefore slightly alkaline. The writing of such decimal fractions consumes both time and space; hence the logarithms representing such fractions are used instead. The logarithm of the decimal fraction 0.0000001 is -7.0000. These logarithms are always minus; hence the minus sign is dropped. The normal hydrogen-ion concentration of the blood is written p_H 7.35, which, interpreted, means that the potential of the hydrogen-ion concentration of the blood is equivalent to a decimal fraction corresponding to the logarithm -7.3500.

A still simpler method of making the hydrogen-ion concentration expressions of urine acidity understandable to patients is to express such acidities not in logarithms but in the number of times that the urine is more acid than the blood, as in Table 4.

The patient readily understands when he is told that the urine acidity should not be greater than two times that of the body. If the urine is as much as 100 times as acid as the body, he easily understands the need for more basic food. A hydrogen-ion concentration determination can be made in one minute, if the proper tubes of buffer mixtures are set up. These analyses also afford excellent means of knowing whether the patient is following the diet closely.

The following brief case reports, selected from a series of fifty cases treated as above, illustrate the results obtained in this series. In this series of ten, there are nine successes and one failure. This represents the proportion of failures to successes in the entire series.

REPORT OF CASES

CASE 1.—Mrs. J. S., aged 65, seen, Dec. 14, 1920, had arterial hypertension and chronic interstitial nephritis, which had been present for a number of years, but an increased blood pressure of 165, systolic, was first observed eight months previously. The condition had been under treatment by elimination through the bowels with daily doses of salts, although the patient had not previously suffered from constipation. The blood pressure on admission was 210 systolic, and 110 diastolic. The patient complained of shortness of breath on slight exertion, vertigo, sour stomach and considerable abdominal distress. The urine contained hyaline casts and traces of albumin. Chemical examination revealed that the blood was essentially normal.

Results.—In the course of five months, the blood pressure fell to 170 systolic, and 110 diastolic. The dizziness and shortness of breath disappeared, as did also the sour stomach and the abdominal distress. The bowels were moving normally. Many of the specimens of urine examined contained no casts, and in some of these no albumin was found. During the two subsequent years, the patient has lived an active life, during the major portion of each year voluntarily assuming the full charge of two active grandsons. With one exception, the blood pressure has remained persistently low, the lowest being

TABLE 3.—*A Basic (Alkaline) Diet (as served)*

BREAKFAST
Baked Apple with Cream
Bacon
½ Slice Toast — Butter
Jelly
1 Glass Orange Juice — 1 Glass Milk
LUNCH
Baked Stuffed Potato — Beets in Cream
Combination Vegetable Salad
½ Slice Bread — Butter — Olives
Iced Cantaloupe
1 Glass Orange Juice — 1 Glass Milk
DINNER
Cream of Spinach Soup
Escalloped Potatoes — Buttered Peas and Carrots
California Fruit Salad
½ Slice Bread — Apricot Ice Cream — Butter
1 Glass Orange Juice — Raisins
Nuts

165 systolic and 110 diastolic, June 15, 1922. The exception, a blood pressure of 220 systolic and 130 diastolic, was recorded, May 8, 1923, following an exceptionally strenuous week of long automobile rides, and the packing incident to returning to her summer home in the East. The blood pressure, June 1, was 180 systolic and 110 diastolic.

CASE 2.—Mrs. L. M. B., aged 58, seen, April 20, 1922, had arterial hypertension, chronic interstitial nephritis, chronic myocarditis, and chronic arthritis. The elevated blood pressure was discovered at this examination. She sought medical aid because of shortness of breath and dizzy spells. She attributed these to her rheumatism, which had been present

3. Clark, W. H.: The Determination of Hydrogen Ions, Williams and Wilkins Company, 1920, p. 38.

for twelve years, and which was made temporarily worse by the removal of some badly infected teeth. The blood pressure on admission was 212 systolic and 100 diastolic. The urine contained many hyaline casts and more than a trace of albumin. The phenolsulphonephthalein excretion was 40 per cent. in two hours. Chemical examination revealed that the blood was essentially normal.

Results.—During the course of ten weeks, the blood pressure fell to 140 systolic and 80 diastolic. The shortness of breath disappeared, the urine was free from casts, and many specimens contained no albumin. The basic diet also appeared to have a beneficial effect on the rheumatism.

CASE 3.—Mrs. N. H., aged 70, seen, May 1, 1922, had arterial hypertension, chronic interstitial nephritis, myocarditis, and cathartic colitis of many years' duration. The blood pressure was 175 systolic and 90 diastolic. There was shortness of breath on slight exertion, and swelling of the ankles. The urine contained a few casts and more than a trace of albumin. The two hours' phenolsulphonephthalein excretion was 55 per cent.

Results.—In the course of six weeks, the blood pressure fell to 148 systolic and 70 diastolic. The shortness of breath disappeared. The casts disappeared from the urine, and the albumin was reduced to a faint trace. The bowels moved normally. The patient was able to take any kind of food without abdominal distress.

CASE 4.—Mrs. M. W. S., aged 43, seen, May 3, 1922, had arterial hypertension, and chronic interstitial nephritis, which was found eight years previously during an abnormal pregnancy with preeclamptic symptoms. Four years before a blood pressure of 220 was recorded at the Mayo Clinic. The kidney function test was then good. The blood pressure on admission was 210 systolic and 120 diastolic. The urine contained hyaline casts and traces of albumin.

Results.—During the next four months, the blood presure fell to 165 systolic and 90 diastolic, and during the next seven months, the highest blood pressure recorded was 190 systolic and 110 diastolic, during a period when the patient had become careless with the diet. She was able to care for her household duties with very much less fatigue. Many of the specimens of urine examined contained no casts and no albumin.

CASE 5.—Miss M. M., aged 29, seen, May 4, 1922, had arterial hypertension and chronic interstitial nephritis. This condition was discovered four months previously on a routine examination which was made because of headaches and nausea. The blood pressure was then 220. The blood pressure on admission was 195 systolic and 90 diastolic. The urine contained a few hyaline casts and traces of albumin.

Results.—In the course of three months, the blood pressure fell to 165 systolic and 115 diastolic. The nausea disappeared, and the headaches were both less frequent and less severe. Many of the specimens of urine obtained at the office and examined while still warm contained no albumin or casts. Twenty months later, the blood pressure was 150 systolic and 90 diastolic, and no casts or albumin were found in the urine.

CASE 6.—G. H., a man, aged 53, seen, June 6, 1922, had arterial hypertension, chronic interstitial nephritis, and spastic colitis. The duration of the blood vessel disease was unknown. The blood pressure on admission was 190 systolic and 130 diastolic. His endurance was poor. The urine contained both hyaline and granular casts and albumin. The phenolsulphonephthalein excretion was 55 per cent. in two hours.

Results.—During the course of four weeks, the blood pressure fell to 168 systolic and 120 diastolic. The casts disappeared from the urine, but a trace of albumin persisted. The spastic colitis responded promptly to the fruit and vegetable diet. His endurance increased rapidly. Ten months later, he spent two weeks at the hospital to have his condition checked as a matter of routine. He had been leading an active business life. The blood pressure was 172 systolic and 114 diastolic. The urine contained an occasional hyaline cast and traces of albumin. The phenolsulphonephthalein excretion was 65 per cent. in two hours.

CASE 7.—E. K., a man, aged 50, seen, July 12, 1922, had arterial hypertension, chronic interstitial nephritis (extremely severe), chronic myocarditis, and constipation. The patient had had nephritis for twelve years. He had been seen previously by a number of careful observers. March 19, 1922, he was seen by Dr. C. S. Stevens of Santa Barbara. The blood pressure was then 237 systolic and 124 diastolic. He had a general edema, dimness of vision, and many hyaline and granular casts in the urine, with 3 per cent. albumin. On a basic salt free diet and absolute rest in bed, the blood pressure fell to 170 systolic and 118 diastolic. The edema disappeared. The vision improved. The albumin in the urine was reduced to 0.5 per cent. He was seen, June 13, 1922, by Dr. J. D. Frick of Los Angeles. The blood pressure was 180 systolic and 124 diastolic. An orthodiagrammatic study of the heart gave a heart area of 166 per cent. The urine contained casts and a large amount of albumin. The phenolsulphonephthalein excretion was less than 10 per cent in two hours. The blood urea nitrogen was 59 mg. per hundred cubic centimeters, and the creatinin was 5.4 mg. per hundred cubic centimeters. Two weeks later, the creatinin was 8.2 mg. per hundred cubic centimeters. The blood pressure on the present examination here was 183 systolic and 95 diastolic.

Results.—It required three weeks on a basic diet to reduce the urinary p_H from 5.5 to 7. There were fewer casts and less albumin in the urine, but no improvement in the phenolsulphonephthalein excretion, which was still less than 10 per cent. in two hours. The bowels were moving normally; clinically, the patient appeared to be better. Because of the heart condition, it was necessary for him to retire from the active life of managing a large ranch. Nov. 18, 1922, following a forbidden automobile trip of 60 miles to his ranch and considerable administrative work on the ranch, he had a uremic convulsion followed by many others, and died in uremic coma, Nov. 30, 1922. The blood pressure taken during the first uremic convulsion period was 170 systolic and 130 diastolic.

TABLE 4.—*Acidity of Urine*

Urine p_H	Acidity Times That of Normal Blood	Urine p_H	Acidity Times That of Normal Blood
7.35	1	5.80	35.4
7.30	1.1	5.70	44.6
7.20	1.4	5.60	56.2
7.10	1.7	5.50	70.8
7.00	2.2	5.40	89.1
6.90	2.8	5.30	112.2
6.80	3.5	5.20	141.3
6.70	4.4	5.10	177.8
6.60	5.6	4.00	223.8
6.50	7.0	4.90	281.8
6.40	8.9	4.80	354.8
6.30	11.2	4.70	446.7
6.20	14.1	4.60	562.3
6.10	17.7	4.50	708.0
6.00	22.3	4.40	891.2
5.90	28.1	4.35	1,000.0

CASE 8.—Mrs. L. C. R., aged 59, seen, Aug. 16, 1923, had had a recent cerebral hemorrhage, arterial hypertension, chronic interstitial nephritis, and life-long chronic constipation. Aug. 9, 1922, the patient had an attack of unconsciousness while en route to Santa Barbara, associated with and followed by loss of distinct articulation and muscular weakness of the left arm and leg. The patient had felt so well that no physician had seen her since her only child was born thirty years previously. The blood pressure on admission was 200 systolic and 100 diastolic. The urine contained hyaline casts and albumin. In this instance, 5 grains each of potassium iodid and sodium bromid were given three times daily, after meals, to assist in the absorption of the blood clot.

Results.—During the next five months the blood pressure fell to 160 systolic and 90 diastolic. There was a marked improvement in the symptoms due to the cerebral hemorrhage. Many of the subsequent specimens of urine contained no casts, and in some no albumin was found. For the first time, in the patient's life, the bowels moved without the use of cathartics.

CASE 9.—J. H. B., a man, aged 80, seen, Feb. 24, 1923, had arterial hypertension and chronic interstitial nephritis of many years' duration. The blood pressure on admission was 276

systolic and 100 diastolic. Cardiac distress was present on very moderate exertion. The urine contained a few hyaline casts and traces of albumin. The bowels were constipated.

Results.—In the course of four weeks, the blood pressure fell to 236 systolic and 118 diastolic, and the patient was able to walk 4 miles a day without cardiac distress. The urinary findings remained unchanged. The constipation was cured.

CASE 10.—Mrs. M. F., aged 60, first seen, April 19, 1923, had arterial hypertension, chronic interstitial nephritis and diabetes mellitus. A blood pressure of 180 had been recorded four years previously, and she had a blood pressure on admission of 200 systolic and 120 diastolic. She complained of fatigue on slight exertion. The urine contained an occasional hyaline cast and traces of albumin. It also contained sugar.

Results.—During the course of a three weeks' stay in the hospital, the blood pressure fell to 142 systolic and 92 diastolic. The patient was able to take walks of 3 and 4 miles each day. The diabetes proved to be mild.

Animal experiments are now under way, designed to ascertain whether such blood vessel disease may be produced by abnormally acid diets. This work was temporarily interrupted by our laboratory work following the discovery of insulin by Banting.[4]

CONCLUSIONS

1. By means of what we are pleased to call basic diets, the acidity of the urine may be easily reduced to a p_H of 7 or more.

2. Under such conditions, patients afflicted with arterial hypertension and chronic interstitial nephritis appear to improve, as evidenced by a fall in blood pressure, a reduction in urinary casts and albumin, and other symptoms referable to this combination of diseases, in 90 per cent. of the cases.

3. This study has demonstrated to us that many of the so-called normal diets contain far too large a proportion of the acid-forming foods, and we might theorize that such acid dietaries may be a factor in the etiology of blood vessel damage.

FOOD ALLERGY AS A CAUSE OF ILLNESS *

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Our knowledge of dietetics has increased rapidly during the last twenty years, chiefly, however, in relation to the essential elements of diet needed by every one. The phase of the subject with which I wish to deal—namely, food allergy—has to do with the ordinary articles of diet which are usually wholesome and harmless but which, under certain circumstances, cause illness.

GENERAL CONSIDERATIONS

A rather large proportion of persons are born with a constitution which makes it possible for them to become hypersensitive to foreign substances. This constitution is hereditary—in fact, a positive history can be obtained in one or both parents in about 50 per cent. of cases. Once sensitive, a person is likely to react in characteristic ways whenever he comes in intimate contact with the substances to which he is sensitive. The condition is common, and afflicts, according to Cook's estimates, about 10 per cent. of all persons. Taken in its broader sense, it afflicts, I believe, an even greater proportion than this, possibly between 12 and 15 per cent.

Since this paper relates to diet, it is proper that the discussion be confined to diet and that illness occurring as a result of hypersensitiveness to substances other than foods be excluded.

Nature of Food Allergens.—Foods which sensitize human beings may be either protein or nonprotein, organic or inorganic. Some foods, such as sea foods, have a greater faculty for sensitizing than others, such as commonly eaten meats, fruits or vegetables. Patients are frequently sensitive to the smaller constituents of a food. For example, as shown by O'Keefe, Shannon and others, infants are frequently sensitive to and made ill by foods they have never eaten, but which constitute part of the mother's diet. Dr. G. B. Webb related to me the case of a patient sensitive to egg who could eat the meat of a rooster but who could not eat the meat of a hen unless the viscera were carefully removed immediately after it was killed. Patients are frequently sensitive to lactalbumin and ovomucoid (the smaller constituents of milk and egg) and frequently to substances in the peeling of fruit or in the husk of grain. It is important to consider this when making extracts for skin testing; for, unless the whole article is used, the very substance responsible for the illness may be lost.

Specificity.—Sensitiveness to foreign matter is often very specific; or, better expressed, a person sensitive to a substance is often sensitive to that one specific substance only. Persons frequently are sensitive to a protein common to several foods which are related biologically. Specificity is more striking in the case of sensitiveness to air-carried allergens than it is in the case of sensitiveness to foods. This may be accounted for by the fact that in sensitiveness to foods the patient may be sensitive to a digestive product common to a number of foods.

Multiple Sensitization.—Persons are occasionally sensitive to only one food. As a rule, however, they are sensitive to more than one. They may be sensitive to a group of somewhat similar foods, such as sea foods, or to several groups of foods, such as fruits and grains, and often apparently to digestive or putrefactive products common to several foods. Persons sensitive to food may also be sensitive to air-carried allergens, such as dander or pollen. For this reason, in testing patients either clinically or by skin tests, it is important to test with a variety of substances.

Sensitiveness and Tolerance.—A patient is not made ill by all the foods to which he is actually sensitive and to which he gives positive skin tests—in fact, as a rule he is actually made ill by relatively few of them. A typical illustration is that of a patient who was sensitive to a great number of foods, to practically every pollen to which he was tested (weeds, grasses and trees), to many varieties of dander, and to other substances. In spite of marked skin sensitiveness, however, he was made ill only by fall pollen of a limited geographic district. This fact is difficult to explain. We may speak of it in a noncommittal way by saying that a patient's tolerance for a great majority of the substances to which he gives positive skin tests is usually such that he does not react to them in the amounts which he encounters naturally or in the ways in which he encounters them naturally.

Time of Reaction.—The time at which reactions occur varies in different patients, although it may be remarkably constant in a given case.

4. Banting, F. G., and Best, C. H.: J. Lab. & Clin. Med. 7:251 (Feb.) 1922.

* Read before the joint meeting of the Section on Practice of Medicine, the Section on Pharmacology and Therapeutics and the Section on Pathology and Physiology at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

Severity of Reaction.—The degree to which patients react to a food is remarkably constant in some persons and varies greatly from time to time in others.

CONTRIBUTORY CAUSES OF SYMPTOMS

While hypersensitiveness to alien matter is primarily responsible for the symptoms of food allergy, other factors often play contributory rôles and determine their location and severity. These factors are mechanical, chemical or thermic, reflex or related to odors or functional activities; in fact, any normal or abnormal condition that tends to disturb the normal function of an organ may play a contributing rôle. The influence of these factors is noticed by the majority of sensitive patients, and often deceives both patient and physician. For example, patients who have dyspepsia and abdominal pain as a result of chronic alimentary allergy are almost invariably made worse by the eating of rough foods, such as nuts or lettuce (mechancial irritants), by the ingestion of irritating foods, such as pepper or mustard (chemical irritants), and by the ingestion of foods which stimulate functional activity in the alimentary tract, such as alcohol, coffee or salt. For this reason, gastric symptoms are often attributed primarily to these contributory causes rather than to the primary cause, allergy. Patients with egg asthma will almost invariably blame wind, dust, smoke, vapors, physical exertion, exposure to cold or change in barometric pressure for their discomfort rather than the primary cause, sensitiveness to egg.

Illnesses that augment symptoms due primarily to allergy are also misleading. For example, patients with egg asthma are invariably made worse by ordinary colds and brqnchitis, and invariably blame this for their trouble. The fact is, however, that a person with egg asthma who invariably has long illnesses with cough and shortness of breath following colds will usually recover if egg is removed from the diet; and, when he is on an egg-free diet, ordinary colds rarely last more than a few days. In my patients with alimentary allergy, a definite abdominal lesion was found in nearly 50 per cent., and it is believed that these lesions played a part in the location and severity of the symptoms due primarily to reaction against foods.

TYPES OF REACTION

When a person is sensitive to food, illness may be caused in five important ways: 1. A reaction, confined to the gastro-intestinal tract, may occur as a result of direct contact between the gastro-intestinal mucous membrane and the product to which it is sensitive. 2. Disorder in the gastro-intestinal tract or in distant organs occurs as part of a general reaction to a food after it has been absorbed and distributed by the blood. 3. When an organ is in an irritable state as a result of reaction, it is unduly disturbed by mechanical, chemical or thermic irritants, by functional activity, by abnormal reflexes, and by other disease that may coexist. This condition frequently misleads both patient and physician, so that a symptom due fundamentally to reaction is often laid at the door of a contributory cause. 4. Illness in no wise related to allergy is occasionally made worse by reaction to foods. For example, in a patient with tabes dorsalis who was sensitive to apple and peach skin, severe lightning pains invariably followed the eating of apples or peaches. 5. Definite organic disease may occur as a result of an acute or chronic state of reaction.

SYMPTOMS

Symptoms referable to reaction to foods are numerous. They may be divided into two classes, namely, those due to direct contact between a food and the gastro-intestinal mucous membrane, and those which occur as part of a general reaction. This distinction is important, for in the former class the patient is usually sensitive to the food as it exists naturally, and usually gives positive skin reactions, and, as a rule, the symptoms appear soon after the ingestion of food. In the latter case, the patient is frequently not sensitive to the food as it exists naturally, and frequently gives negative skin tests. Furthermore, he often reacts clinically to groups of somewhat similar foods, and frequently gives delayed reactions. The diagnosis in cases of this type is often very difficult.

The symptoms should be classified, further, as those caused by reaction to common articles of diet and those caused by reaction to uncommon articles of diet. In the former case, the illness is usually a chronic one, may easily be mistaken for some other chronic disease, and is often difficult to diagnose. In the latter case, the illness is usually acute, of short duration and recurrent, and can often be diagnosed by the history alone.

Contact Symptoms and General Symptoms.—The gastro-intestinal, ocular, nasal, pharyngeal, bronchial and cutaneous symptoms (dermatitis) can occur either as a result of direct contact with an offending substance or as part of a general reaction. The neurologic symptoms, joint symptoms, bladder symptoms, hypotension, eosinophilia, hives and angioneurotic edema, on the other hand, can occur under ordinary conditions only as part of a general reaction caused by an allergen which has been distributed by the blood. The presence of one or more of the latter group of symptoms can therefore almost always be looked on as evidence of general reaction. This distinction is important in differential diagnosis. For example, if a patient has nasal and bronchial allergy alone, he is usually sensitive to an air-carried allergen. If, however, he has in addition hives, angioneurotic edema, bladder disturbance or other symptoms of general reaction, the trouble can be traced almost always to a food or to some product which has reached the circulation without causing marked local disturbance. It so happens that air-carried allergens are not often absorbed in sufficient quantity to give rise to a general reaction.

The more interesting of the abdominal symptoms are abdominal pain, which may be either steady or griping, local or general, mild or severe, acute or chronic. It is often related to the eating of food, and frequently appears a few minutes after the ingestion of some particular food. Other alimentary symptoms of interest are dyspepsia, nausea, vomiting, bloating, diarrhea and mucous colitis, which may be either acute or chronic. The foregoing symptoms may simulate those caused by other illnesses, but rarely simulate them perfectly, so that they are rarely mistaken for organic diseases by careful physicians.

Other general symptoms are the ocular, nasal, pharyngeal, bronchial and cutaneous, with which all are familiar.

The neurologic symptoms are possibly worthy of especial mention. Weakness and nervousness are common.

I have under observation a patient who for one year had convulsions with involuntary discharge of urine and feces, followed by coma, occurring once or twice daily, and followed by transitory migratory paralysis or

anesthesia of one of the extremities or of an entire side. I saw her during an attack, and observed that she was definitely asthmatic. On administration of epinephrin, she promptly recovered from her coma, which usually lasted from four to six hours. She has been free from cerebral symptoms now for one month since she has been treated as an allergy case. Transitory migratory paralysis of this sort is not unknown in medical literature, and could easily be the result, I should think, of an allergic reaction involving some of the cerebral tissues.

Other symptoms of interest, with which all are familiar, are headache, arthritis, hypotension and bladder disorder.

Arthritis is possibly worthy of especial mention. Joint pain and swelling is a very definite and interesting manifestation of allergy. Dr. R. C. Lowdermilk, in 1912, related to me the case of a patient who, following a therapeutic injection of pollen, developed a typical rheumatic joint, for the first time in her life; it lasted several hours during her reaction, and then disappeared completely. The development of joint pain and swelling, as part of a general reaction to therapeutic serums, is not uncommon. There is some similarity between the joint symptoms of acute articular rheumatism and that of a reaction of allergy. For example, the pain and swelling may migrate from joint to joint within a period of a few hours, or, in fact, at times, almost within a period of minutes. It is impossible that symptoms due directly and entirely to local infection could appear or disappear at such a rate. Migration and rapid change, on the other hand, are striking characteristics of the symptoms due to allergy. While there is no doubt that acute articular rheumatism (i. e., acute migratory polyarthritis) is an acute infectious disease, it is not impossible that some of the local symptoms, such as pain and swelling, are in part the result of an allergic reaction about the infected joints. In fact, I have used epinephrin in the treatment of acute articular rheumatism in several cases, to be reported later, with brilliant temporary result, and believe that it is useful in the therapy of this disease. Epinephrin in hypertrophic, atrophic and chronic infectious arthritis yields less, but often noticeable, temporary benefit.

DIAGNOSIS

It hardly comes within the scope of this paper to discuss in detail the diagnosis of allergy. Suffice it to say that it should be suspected in any patient suffering from one or more of the symptoms just mentioned, especially if there is past or family history of hay-fever, asthma, chronic urticaria, eczema or other symptoms characteristic of the condition. It should also be suspected in any patient displaying symptoms that cannot be accounted for by other clinical findings. The history is especially important if symptoms bear a relationship to the ingestion of certain foods.

Dermal and intradermal tests are very useful aids in diagnosis. In food cases, however, skin tests, especially cutaneous tests, often fail completely. This is probably due to the circumstance that patients are not always sensitive to the food as used in the test solutions, but are sensitive to the food after it has been acted on by digestive juices and bacteria.

Positive tests indicate that a person is sensitive to a given food. It does not indicate that he is made ill by the food as encountered naturally, so that results obtained by skin reactions cannot be taken as positive evidence, and are almost worthless unless used in conjunction with the history, clinical findings, and clinical tests. A diagnosis should not be considered proved unless symptoms can be relieved by withdrawal of the suspected food from the diet and reproduced again during a well period by the eating of the suspected food.

The technic for skin testing can be shortened and simplified through the use of preliminary group tests —that is, through the use of mixtures of from five to ten substances which are related either biologically or chemically. Testing with single extracts is time consuming and disagreeable to the patient. Its use on a broad scale is difficult.

Group tests frequently enable one to suspect a certain mixture. Further tests can then be made with each constituent of the mixture, and in this way a great deal of time and trouble can be saved for both patient and physician. Final conclusions should not be drawn from preliminary group tests. This statement, however, applies equally to positive tests obtained by the use of individual substances.

Group reactions frequently come out more strongly positive than tests with single extracts, and vice versa. The former is often true even when the solution of the individual extract is stronger than the mixed preparation. A clue gained from group testing is often more useful than that gained from subsequent individual tests.

TREATMENT

It is hardly possible in a paper of this scope to discuss in detail the treatment of allergy. The problem can be approached from four different angles: by (1) avoidance of the offending food; (2) specific protein treatment; (3) nonspecific protein treatment, and (4) symptomatic treatment.

Avoidance is the method of choice when a patient is sensitive to a relatively uncommon article of diet.

Specific protein treatment is justified only in the case of sensitiveness to foods used so commonly in cooking as eggs, milk or wheat. Specific protein treatment by mouth is a more logical method of increasing tolerance in the case of food allergy than is treatment by injection, because in the latter case one cannot be sure he is using the actual substance to which the patient is sensitive. It is more difficult to increase tolerance in the case of food allergy than it is in the case of pollen allergy. In one case of egg asthma, for example, I increased tolerance for egg subcutaneously in marked degree. I was not able, however, after a three months' trial, to increase the tolerance for egg by mouth to the point at which the patient could take by mouth more than 8 drops of a solution made by mixing 1 drop of egg with 250 c.c. of salt solution.

Nonspecific protein treatment is justified in case one is unable to find and remove the substance causing the reaction.

Symptomatic treatment with epinephrin and atropin is very useful in emergencies and for temporary relief. One cannot estimate without trial the dose of epinephrin required for relief. It varies ordinarily from 0.2 c.c. to 1.5 c.c. of a 1:1,000 solution given subcutaneously. For this reason, it is advisable to give 0.5 c.c. or less subcutaneously every ten minutes until relief is obtained or until the patient shows marked evidence of reaction to epinephrin (tremor, pallor, nervousness, palpitation, etc.). The dose that gives relief can be repeated when symptoms begin to return, and can be kept up indefinitely. As a rule, the dose can be gradually reduced.

SUMMARY AND CONCLUSIONS

A certain rather large proportion of persons inherit a constitution which makes it possible for them to become hypersensitive to foreign substances. Once sensitive, they are likely to react in characteristic ways whenever they come in intimate contact with the substances to which they are sensitive. Hypersensitiveness to food is relatively common, and is frequently responsible for disorder in the gastro-intestinal tract and in distant organs.

Foods that sensitize may be either protein or nonprotein, organic or inorganic. Sensitiveness is occasionally confined to one food. Multiple sensitization is more common, however. Patients are often sensitive to products common to several foods, and often apparently to digestive or putrefactive products common to several foods.

A patient is not made ill by all the foods to which he is actually sensitive and to which he gives positive skin tests. This may be accounted for in a noncommittal way by saying that a patient's tolerance for the majority of substances to which he is actually sensitive is usually such that he does not react to them in the amount which he encounters naturally, or in the ways in which he encounters them naturally.

The time at which reaction occurs varies in different patients, although it may be remarkably constant in a given patient.

The degree to which a patient reacts to foods is remarkably constant in some individuals, and varies greatly from time to time in others.

Illness in a hypersensitive person may be caused in five important ways: 1. There is a reaction of contact between the gastro-intestinal mucous membrane and the product to which it is sensitive. 2. A disorder in the gastro-intestinal tract or in distant organs occurs as part of a general reaction to a food after it has been absorbed and distributed by the blood. 3. When an organ is in an irritable state as the result of reaction, it is often unduly disturbed by mechanical, chemical or thermic irritants, by functional activity, by abnormal reflexes and by other diseases which may coexist. This third condition frequently misleads both patient and physician, so that a symptom due fundamentally to reaction is often attributed to a contributory cause. 4. Illness in no wise related to allergy is occasionally made worse by reaction to foods. 5. Definite organic disease may occur as a result of an acute or chronic state of reaction.

Symptoms referable to allergy should be carefully divided into two classes, namely, contact reactions and those referable to general reaction. This distinction is fundamental, for patients sensitive to air-carried allergens rarely absorb a quantity sufficient to give rise to general symptoms, whereas, in allergy due to foods, symptoms of general reaction are common.

The symptoms should be classified further as those due to unusual articles of diet and those due to common articles of diet. In the former case the illness is acute, of short duration, and recurrent. In the latter case, it is usually chronic but often subject to remission.

The more interesting of the symptoms may be classified as the gastro-intestinal, ocular, nasal, pharyngeal, bronchial and cutaneous (dermatitis), which may occur either as a result of contact or as part of a general reaction, and the neurologic and bladder symptoms, hives, angioneurotic edema, headache, arthritis, hypotension, and eosinophilia, which, under ordinary conditions, occur only as part of a general reaction.

The diagnosis of the condition should be based on all the information that can be gained from the family and personal history, physical examination, special examinations, and cutaneous, intracutaneous, nasal, conjunctival and clinical tests. A diagnosis should not be considered proved unless the illness can be relieved by withdrawal of the food to which the patient is sensitive and reproduced during a well period by the eating of the suspected food.

The technic for skin tests can be shortened and simplified through the use of preliminary group tests; and, for a broad routine use of intradermal tests, this is almost essential.

A note of warning should always be given in a discussion of cutaneous or intracutaneous tests, since some patients react violently. Accidents can practically always be avoided, however, if a history is carefully taken and testing is done with extreme care in the highly sensitive patients. Epinephrin and atropin should always be kept on hand, ready for quick use.

Treatment of the condition can be approached from four angles: (1) the method of choice, i. e., avoidance of the offending food; (2) specific protein treatment—justified only in the case of sensitiveness to an article of diet used so commonly in cooking, such as milk, eggs or wheat; (3) nonspecific protein therapy—justified only in case the substance responsible for illness cannot be found or removed, and (4) symptomatic treatment with epinephrin and atropin—useful in emergencies and for temporary relief.

Waldheim Building.

EXISTENCE OF A HITHERTO UNKNOWN DIETARY FACTOR ESSENTIAL FOR REPRODUCTION *

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If female rats are reared on the now well known "synthetic" nutritive regimen consisting of fat, carbohydrate and protein in relatively pure, separate form, to which are added an appropriate salt mixture and daily doses of the vitamins A and B, normal growth and every appearance of health results. The animals are of splendid size, sleek coated and active. Depending somewhat on the season of the year, either a large proportion or, indeed, practically all of such animals are sterile. We have employed a basic ration of casein (18), cornstarch (54) and lard (15), following Osborne and Mendel, to which milk fat (9) and salts [1] (4) are added, the animals receiving separately and daily from 0.4 to 0.6 gm. of dried whole yeast (Harris). The sterility produced is a dietary deficiency disease, and can be quickly cured by a change of dietary regimen. It yields a highly characteristic picture, the chief features of which are the occurrence of appar-

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1. The salt mixture adopted was that which has been frequently employed by E. V. McCollum, and which consists of: sodium chlorid, 0.173; anhydrous magnesium sulphate, 0.266; crystallized sodium acid phosphate, 0.347; Dipotassium hydrogen phosphate, 0.954; hydrated calcium acid phosphate, 0.540; ferric citrate, 0.118; calcium lactate, 1.300.

ently normal estrus and ovulation and the fertilization and implantation of the developing ova, but invariably disease and resorption of the products of conception.

It at first occurred to us as possible that we had discovered in the rat a need for the antiscorbutic vitamin C which was not evidenced in any other way in this animal. In order to test the point, the basic dietary regimen was supported by the daily administration of orange juice in one series of experiments and by lettuce leaves in another series. Only one gestation out of five or six was successful with the orange juice regimen, but every individual tested produced litters of healthy young when fresh green lettuce leaves had been added to the dietary. It thus seemed apparent that we were in the presence of a new member of the "vitamin" substances, or specific dietary needs, which we have provisionally designated by the letter X or as the antisterility factor, and we have attempted to chart its occurrence in natural foodstuffs by the simple test of whether or not they would alleviate or fail to alleviate the dietary sterility disease. Several hundred gestations have been conducted in the following manner:

Littermate sisters have been reared on the foregoing so-called "synthetic" or pure dietary regimen, and every individual permitted to have a first, or trial, gestation. In this manner it was possible to use animals in which, in the case of every individual, the occurrence of sterility had been proved. At this juncture, and only at this juncture, in some of the cases a single natural foodstuff was added to the diet and the fate of further trial gestations now ascertained. The remaining animals were retained as controls, maintained merely on the original ration. Their sterility has continued unabated.

When animals of the opposite sex are paired and some weeks allowed to elapse without offspring being produced, while sterility is highly probable, it is nevertheless proper to regard it as only presumptive. It appears possible, however, to establish it beyond peradventure by proper attention to the various steps in the physiology of reproduction. We have taken the precaution to mate females whose fertility it was sought to investigate only with males of known fertility and at the incidence of the appropriate time in the estrual cycle, as determined by daily examinations of the vaginal smear. Control experiments with normal females have taught us that somewhat more than 80 per cent. of animals handled in this way will accept coition and will deliver litters of healthy young at the conclusion of twenty-two days of gestation. Furthermore, in all cases we have known the complete sexual history of our animals, i. e., the time of occurrence of the first and of all subsequent ovulations; inseminations were carried out at the first estrus beyond the sixtieth day of age.

In all instances the occurrence of sexual congress has been confirmed by the detection of the plug (bouchon vaginale) and by the microscopic detection of residual sperm in the vaginal canal. A further check on the fate of an insemination is afforded by our use of the "placental sign," i. e., the appearance of erythrocytes in the vaginal smear from the fourteenth to the seventeenth day of gestation. This phenomenon occurs in all normal gestations and is probably indicative of placental leak; at any rate, it heralds the existence of placentation (Long and Evans). We never miss it in cases in which implantation has occurred, nor is it found when the ova (whether fertilized or not) fail of implantation. By its detection one may satisfy oneself that all of the early steps in the trial gestation have been accomplished (insemination, ovulation, fertilization, migration and implantation of the ova).

It is remarkable that all these events take place in females with the specific dietary sterility disease, but that the expected young are never born. Necropsies performed late in gestation show various stages in the resorption of the young. A normal proportion of eggs have been fertilized and implanted (at least two thirds of those liberated per ovulation), as determined by comparing the number of corpora lutea of gestation in each ovary with the corresponding number of implantation sites in each uterine horn. Some of the implantations have apparently begun to resorb shortly after their establishment. In them no trace of the embryo persists; whereas in other cases macerated embryos or, indeed, large fetuses may be found; rarely, a single fetus is found still living. Studies of the uterine mucosa just before implantation (i. e., late in the fifth day after coition or early in the sixth day) show that the "implantation bed" is abnormal, for a quite massive extravasation of erythrocytes has occurred, presumably by diapedesis, infiltrating the connective tissue meshes of the endometrium. When placentas are established, these exhibit a similar type of abnormality, for there are hemorrhages in them and other circulatory faults, chief of which is the occurrence of characteristic greatly distended maternal venous sinusoids.

It might thus appear that the dietary sterility disease is occasioned solely by faulty implantation and specifically by the placenta's need of some dietary constituent for endothelial strength. It is not so clear, however, that the deficiency disease attains its effects solely by impairment of placental structure and function. The conception was, indeed, somewhat strengthened by our accidental finding that in some cases foods that cured the disorder were administered after ovulation had taken place, and had therefore affected the developing young, chiefly if not entirely, after the uterine attachment had been made. Yet the unequal progress of the disease in two neighboring blastoderms adfixed in the uterine wall only a few millimeters apart is hard to explain except on the basis of unequal resistance to destruction on the part of the embryonic tissue masses. Something must be said for the hypothesis of primary disease in the ova themselves. Our recent discovery that the spermatozoa are injured and, in fact, eventually destroyed by the basic dietary regimen lends support to the theory that the germ cells themselves possess a fundamental need for the new dietary constituent.

In attempting to discover the cause of inadequacy in our "pure" or basic ration, we have given some attention to the protein moiety. A higher protein content in the form of more casein does not relieve the situation, nor have any changes that we have made in the quality of the protein resulted in cures. Thus, yeast protein has been added to the casein, and lactalbumin has been substituted for casein, without avail. Furthermore, belief that the limiting factor in casein inadequacy would lie in its low cystin content led us to add this amino-acid to the casein, without avail.

Since it seems hardly likely that the chief caloric constituents of the diet (lard and cornstarch) could be at fault, we next investigated the possibility of inadequacy in the vitamins A and B, an inadequacy conceivably shown up only by the unusual demands of reproduction.

The statement has already been made that when yeast was added in such quantity as to yield additional support to the protein, cures of the sterility did not result. Thus, a fourth by weight of the entire ration has been constituted by whole dried yeast, with consequent enormous excess of the vitamin B.

When the butter quota was greatly increased (i. e., so as to constitute 25 per cent. by weight of the diet), it is true that some cures of the sterility resulted; and when animals are reared in this way, they may be normally fertile. We believe that this is due to the possession by milk fat of a definite, though low, quota of the new dietary substance. Our reasoning here is as follows: Crude Norwegian cod liver oil was obtained by us and compared with our own milk fat for its content of the vitamin A. Our tests showed it to contain at least eleven times as much of the vitamin A as did the butter. When the milk fat quota of our diet was replaced by this cod liver oil, the animals (which not only showed no signs of deficiency in vitamin A but which we must furthermore assume to have possessed a great excess of this factor) were nevertheless sterile. And the sterility disease has continued unabated when in some cases we happened to employ for a limited time 25 per cent. by weight of the cod liver oil. The experiments with this substance would also appear to enable us to segregate the new factor from the vitamin present in cod liver oil which is responsible for the cure or prevention of rickets and has been designated tentatively by McCollum as vitamin D.

The efficacy of fresh green lettuce leaves in curing the dietary sterility is always very striking. To the animals it perhaps constitutes an especially attractive relief from the basic diet, for one has no difficulty in getting them to consume large quantities of it. The curative dose most frequently employed by us has been 40 gm. of the fresh substance, an amount corresponding to somewhat less than 1.5 gm. of dry weight. In the colony, it has become a routine way of restoring fertility and of thus furnishing what we have always regarded as the necessary proof of the normality of an animal, when various other attempted dietary cures have failed. To date, forty-five trial gestations have been studied with this as a curative substance, and all but one of them has resulted in the birth of normal litters of young. Two tests have indicated that as little as 10 gm. of the fresh leaf substance may result in the birth of healthy young. We have further ascertained that the seedlings of the Canadian field pea similarly restore fertility. It is too early to report on quantitative tests which will determine whether or not any loss occurs in the content of the new vitamin when leaves are dried. Fertility has usually resulted when we administered 1.5 gm. of the powder made from lettuce leaves dried in an oven with fair air exchange and at a temperature of 100 C. The powder that is obtained from milling dried alfalfa leaves is similarly effective.

While the experiments that have been reported above would seem sufficient to separate the new dietary factor from the water soluble vitamin C, or antiscorbutic substance, this separation is effected in a much more conclusive way by the fact that the whole cereals protect against sterility, or cure it when it is once established. Thus, whole wheat and oats are effective. From negative tests we are certain that white patent flour is ineffective, even when constituting one third by weight of the total ration, whereas careful work with wheat embryo has shown a remarkable potency of this substance. It is now possible to state that 0.25 gm. daily (250 mg.) of wheat embryo restores to normal fertility animals in each of which, as is usual in our routine, the sterility disease had been proved to exist.

One of the surprising results has been the demonstration of an almost total absence of the new vitamin from milk. Fresh milk has been faithfully administered with a pipet in 5 and 10 c.c. doses without effect, and we next sought to recover some of the possible content of milk in the new factor by employing the total milk solids. When these were used, either as skim milk powder or as whole milk powder so as to constitute as much as one fourth or one third by weight of the total ration, the sterility disease continued unabated in most cases.

The factor essential for normal reproduction may occur in a wide variety of foods. We have found it present in egg yolk by administering daily one third of the fresh total yolk substance, and to our surprise it has been possible to demonstrate it in meat. The jaw and cheek musculature of the cow contains enough of it for daily doses of 1 gm. of the cooked meat to be adequate.

We have also conducted several hundred experiments in which small amounts of single natural foodstuffs have been used as prophylactic rather than curative substances. The trial foodstuff was administered during the early lifetime of the animal, and as a rule a minimal period of forty days has intervened between weaning, when the animal was put on the prophylactic diet, and the inauguration of the first trial gestation. These experiments were conducted not merely to demonstrate the prophylactic or protective action of certain foods, but also in the hope that we might be able to show that the new food essential is stored by the body. It is conceivable, for instance, that foodstuffs which fail to contain enough of the substance X to invoke fertility immediately, when fed during the twenty-one days of an actual gestation could nevertheless contain appreciable amounts of the new substance and, if the phenomenon of storage occurs, amounts large enough enable reproduction ultimately to take place. We have shown that lettuce leaves, either fresh or dried, cheek muscle, the cereals, egg yolk, and beef liver all bestow a complete prophylaxis or protection. At the same time, some of the substances that are not completely satisfactory when administered during the short time involved in the curative experiments are entirely so when used for a longer period for prophylaxis. This was the case, for instance, with 25 per cent. milk fat, and in a few cases even with one third by weight of milk powder. The phenomenon of storage is, however, best shown by the survival of fertility when animals have been transferred from a satisfactory ration to the basic, or "pure" diet. In these instances, depending on the abundance of the factor X in the previous satisfactory diet, animals maintain their fertility for a greater or lesser time.

Finally, it has been possible to extract the curative principle from curative foodstuffs with 80 or 95 per cent. ethyl alcohol and with ether. This is singularly concentrated in the deep brown oil thus obtained by ether from wheat embryo after preliminary treatment with hot 80 per cent. alcohol. A daily dose of slightly more than 100 mg. of this oil confers cures of the dietary sterility. In most instances, water extracts have been ineffective.

Although many experiments are in progress, we are as yet not ready to report fully on the production and cure of dietary sterility in the male; but it is of interest to note that the disease occurs there, and that in the case of the male we must look on germ cell injury as the undoubted effect of lack of the new dietary substance.

FOOD SELECTION VERSUS FOOD COMPOUNDING *

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The diet consists of two parts: maintenance ration and work ration. The maintenance ration (which does not need to contain more than 2,000 calories) must contain the salts, balanced protein and the vitamins essential to growth and health. The work ration consists of starch, fat and protein in proportions agreeable to the individual, partly determined by price considerations.

We are not in a position to give quantitative formulas for the maintenance requirements. It is commonly agreed that 1 gm. of protein per kilogram of body weight is sufficient to cover the tissue requirements. How much of this protein must be balanced is not known. From the researches of the literature one cannot construct a formula for the requirements of the essential amino-acids. Certainly the proportion of balanced protein must be higher during youth than in adult life. Obviously, it is wise to lean to the safe side. In an ordinary mixed diet, probably half of the proteins naturally would be balanced. The more restricted the protein intake, the larger must be the proportion of balanced proteins.

The mineral salts are definite enough substances, and yet we are not informed as to the exact requirements. In part, the utilization of salts depends on other components of the diet. For example, the mineral metabolism of the milch cow, and, indeed, the actual utilization of minerals in the diet, depend in part on the content of green leaves in the diet. We draw our salts principally from milk, meat, fruits and vegetables. It was long taken for granted that mineral deficiency in the diet was rare. Of late, however, it has become clear that this is not true. A supervision of the diet must include a scrutiny of the mineral intake.

The intake of vitamins required to support growth and sustain health is fairly well established for animals in terms of the different nutrients in which they are contained. Until it is possible to determine the vitamin content of foodstuffs in some other manner than by the use of the feeding experiment, we cannot hope that exact knowledge for human beings will be easily attained. We obtain the fat-soluble vitamin largely in milk, eggs, the viscera of animals, leaf vegetables and a few fruits. The antineuritic vitamin is secured from the coverings of grains, meat, eggs, milk, and a variety of fruits and vegetables. The antiscorbutic vitamin is contained in practically all foods in the raw state, and the intake of this factor is largely related to the consumption of raw foods.

A survey of foodstuffs and of the experimental literature on the subject of nutrition indicates that it is possible within a wide range to combine different foodstuffs with the retention of adequate competence in every direction. Round a quart of milk as the nucleus, one may group almost any conceivable, reasonable combination of foodstuffs to complete the diet. Our diets have been developed on our soil by custom and taste, on the basis of instinct. The farther the population lives from the land, the more is the diet exposed to changes. With diversification of the conditions of living, the probability of error becomes increased. So long as the agriculture of an area is diversified, the diet is likely to be diversified and competent. If agriculture is one-sided, the diet tends to be unbalanced. It happens, therefore, that diets in some country districts are more one-sided and less competent than in cities. For example, the diet of the poorer classes in the cotton belt is less balanced and competent than the diet of the urban textile cotton operatives in New England. Perfection of transportation and development of storage and marketing operate in the direction of diversification of the diet, and represent an insurance against the occurrence of deficiency diseases. Diversified agriculture, efficient transportation and effective marketing protect the urban population against shortage of food supplies.

NECESSITY OF EDUCATION

It has become clear that, under modern circumstances of economic pressure, large classes cannot safely be permitted to have their diets determined by chance, superstition, taste or price. Education becomes imperatively necessary. In a large country, including both the temperate and the semitropical zones, with areas of low and high rainfall, extending from sea level to the altitudes of our mountainous states, with ample avenues for transportation that include facilities for refrigerated shipment of perishable foodstuffs, and with elaborate governmental regulations for control and inspection of produce, it would seem that every family should be in position to select foods over a wide range of choice, within the confines of the family income vouchsafed by our high standard of living. Nevertheless, there is clear evidence that this is not the case. This is, in part, the result of ignorance, and this may be as pronounced in the insular native population as in the unassimilated immigrant population. The wastefulness and inefficiency of our distributive system deprive classes with small incomes of opportunity to include in the diet articles freely produced within the country. Whether the cause of a one-sided selection of the diet is ignorance or poverty, the function of education is equally important.

The campaign of education, particularly necessary in relation to children, represents insistence on the indispensability of milk, leaf vegetables and raw fruits in the diet, irrespective of ordinary price considerations. Without going into the question of vegetarianism, I feel also that it includes insistence on a certain proportion of animal protein in the diet. The correct way of combating the high price of milk, leaf vegetables and

* From the Food Research Institute, Stanford University.
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raw fruits (and these must remain relatively costly because they are perishable) consists, in part at least, in reducing the cost of the work ration. With improved methods of production, costs of these foods should fall. But higher standards of sanitation operate in the opposite direction. If flour, sugar, lard, vegetable oil and potatoes are cheap, even the small family income can meet the requirements in the direction of the indispensable foodstuffs. Probably, in the long run, more can be accomplished by cheapening the work ration than by cheapening the maintenance ration. In any event, the public must be brought to the understanding that the maintenance ration must be held inviolable. The diet cannot be selected on considerations of price per pound or per calory. Naturally, as between alternatives in the maintenance ration, price considerations may be permitted to operate. But too much is not to be expected in this direction, because the season of plentiful milk and eggs is also the season of leaf vegetables and fresh fruit. A glaring illustration of neglect of a cheap, competent foodstuff is observed in the current aversion to viscera of beeves, calves, sheep, lambs and swine. This aversion to viscera is an American characteristic. These organs contain more balanced protein and are richer in fat-soluble vitamin and salts than the muscular tissues of the same animals. Yet, to a large extent, these viscera are employed as fertilizers and animal feed instead of food in the United States.

A SINGLE COMPETENT FOOD

With advancing knowledge, the thought arose to attempt the compounding of a single competent food. This is being undertaken praticularly in the direction of bread, of which certain vitamin breads are well known illustrations. If full milk is used instead of water in the making of bread dough, this alone makes the bread a relatively complete foodstuff. If, in addition, salts and water-soluble vitamins are added, the competence becomes complete. One can build up a bread by the addition of balanced protein and vitamin-containing substances so that it covers the maximum requirements. Just as the standard, balanced growth ration of the white rat laboratory includes everything required for these animals, so it seems possible to incorporate into a bread everything required by the child. If such a bread were to become the standard bread of the family, obviously the maintenance diet would be made competent at one stroke, and danger of deficiency diseases eliminated. To such a bread one would merely add roughage and fuel foods to meet the caloric needs of physical work.

Whether such a simple solution can be made effective is, however, a different question. If a family had the dietetic vision to select such a bread irrespective of price, it might also be expected to have the dietetic vision to select the essential components in a mixed diet. The housewife who understood the function of these proteins and vitamins in such a bread would also understand them in milk, fruits and vegetables. There is a price difference. Such a bread is necessarily more expensive than ordinary bread. This, however, is illusory. Milk can be sold in bread at a cheaper price than as fluid milk, probably for half the price. A compound milk-bread, therefore, may represent not merely a competent physiologic ration, but a direct saving to the family. Milk-bread is cheaper than bread and milk. To what extent this works out in actual practice on a large scale must be left to the future.

Certainly, for certain sections of the population of the United States, such a complete bread would represent a positive gain in the diet. Consider the average diet of the poorer white people in the cotton belt. The agriculture is not diversified. There is scarcity of milk, eggs, meat and green vegetables. Replacement of quick rising biscuits by a full-ration bread would represent an important improvement in a diet that consists otherwise largely of lard, beans and sweet potatoes. Such a bread would find also a well-deserved place in the school lunchroom. It would piece out the various inadequacies of the diet of uneducated classes. The lunch of the shopper, clerk and shop girl, now largely sweet stuffs, would be improved if the bread were milk-bread. In practical terms, such a bread amounts to a bowl of bread and milk. The technical achievement consists in the incorporation of milk in the diet in a practically nonperishable form. Milk-bread has a large meaning for agriculture in that it saves casein and enlarges the radius of marketing of the dairy, making it possible for distant producers to send milk to the city market, delivered in bread.

On the other hand, the attempt to administer a large proportion of the diet in the form of a single food runs counter to natural tastes. In the long run, a bowl of bread and milk may prove more satisfactory than a slice of milk-bread. The impulse for variety in the diet is insistent and has good physiologic and psychologic grounds. The attempt has frequently been made to incorporate all the components of the diet into a single foodstuff. This has been done for use in travels, explorations, camps, mines and experiments. The result has been monotony and lack of satisfaction, eventuating in revulsion. The cuisine of a people is built around two factors: The seasonal supply of different foodstuffs and the demand for diversity in the diet. It is possible to increase the competence of the diet and at the same time reduce the number of articles; but the movement runs counter to natural tastes. The all-food bread and the milk-bread will find their levels in popular esteem and use. Popular education will aid their use somewhat, but price and taste are sure to be of influence also.

THE PRESSURE OF PRICE

Modern improvements in technology suggest that it may soon be possible to improve the competence of the diet and at the same time meet price considerations by supplying essential components in concentrated form. The fats of the viscera are rich in fat-soluble vitamin. These fats are scarcely employed in the diet today, except in the medicinal use of cod liver oil. They go largely into soaps. The great value of the viscera of fish has been demonstrated in eastern Europe, where the health of many children has been preserved by the eating of whole smoked herring. Visceral fats of animals are similar to cod liver oil and may be used to supplement milk and butter. It will, however, first be necessary for odors and tastes to be removed. There is no technical reason why this cannot be accomplished. I have seen herring oil practically devoid of fishy taste and odor. There seems no reason why the fats of viscera, rich in fat-soluble vitamin, should not be collected, purified, concentrated and employed in the kitchen and on the table. In the same manner, there is no technical reason why concentrated solutions of extracts of the water-soluble vitamin, especially the antineuritic vitamin, should not be prepared. It is, indeed, not out of the range of imagination to look

forward to the day when mixtures of salt and solutions of vitamins may be employed on the table after the fashion of condiments. This is merely carrying one step further the technology that has resulted in the production of the competent diet for the white rat colony. This forecast has meaning for the physician as well as for the housewife. At the same time, we recognize that such use of salts and vitamins would run counter to the natural concept of the cuisine and might fail for that reason.

In the final analysis, we look forward to the development of devices to meet the demands for the competent diet against the pressure of price, and these may be expected to proceed *pari passu* with the intelligence of the public in matters of physiology. In matters of animal husbandry, little resistance is encountered. The governmental departments, the schools of agriculture and the experiment stations find agricultural classes willing and ready to accept and put into operation scientific instruction in the diet of domesticated animals. With each year, the ratio of productive output to maintenance is increased; the milch cow yields more milk for the annual unit of food, the meat animal more flesh, hens more eggs. The campaign of education in agriculture succeeds because it pays. When education in matters of the diet is founded on economics as well as on physiology, similar progress may be expected also in this direction.

PATHOLOGIC EFFECTS OF LACK OF VITAMIN A AND OF ANTI-RACHITIC VITAMIN *

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One of the surprises that have come from nutrition investigations during the last fifteen years is the discovery that certain fats or more complex lipin extracts exert remarkable effects on the nutritive well-being of human beings and animals. Previous to that time, it was believed that fats were of value essentially only as a source of energy. The investigations in this field support the belief that the special rôle which certain classes of fats derived from various sources exert on metabolism is not due to any component either of the fat molecule as fatty acid or glycerin, or of the molecules of the complex lipin, such as lecithin and kephalin. It seems clear that whatever effects on nutrition are produced by fats are to be attributed to the presence of some substance or substances which are dissolved in the fats and accompany them when extracted from natural foods because of their solubility in lipins.

The first investigator in this field was Stepp, who clearly demonstrated in maintenance experiments on grown mice the necessity of certain lipins in the diet. Stepp did not interpret his results as indicating the existence of some substance not of a lipin nature in his preparations which was indispensable in normal metabolism, but believed that certain complex lipins must actually be supplied in the diet, just as certain derivatives of proteins cannot be synthesized in the animal body but must be provided among the sources of nutrient principles.

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EYE DISEASE FROM LACK OF VITAMIN A

In 1913, Osborne and Mendel, and Miss Davis and I almost simultaneously demonstrated a remarkable effect on the stimulation of growth when certain fats were added to certain experimental diets. Certain other fats did not produce this effect. Fats of animal origin have in general proved to possess dietary qualities not possessed by plant fats in general, and such conditions as exist are due, not to the nature of the fats themselves, but to some principle associated with them. The earliest experiments demonstrating the unique value of certain fats of animal origin, such as butter fat, cod liver oil, egg yolk fat, and fats of glandular organs of mammals, were based on experiments in which diets were used which were so constituted as not to produce growth when vegetable fats were added, but a decided growth and marked improvement in well-being when animal fats such as those mentioned were incorporated in the diet. Earlier investigators had several times called attention to a peculiar eye condition characterized by edema of the eye lids and xerosis of the conjunctiva, which was believed to be of an infectious nature and to result from low resistance of experimental animals because of a poor state of nutrition. Osborne and Mendel pointed out that some of their animals in this condition showed prompt recovery from the eye disease when butter fat, cod liver oil and other fats which exert a favorable influence on growth was restored to experimental diets on which the animals had suffered malnutrition. During a period of some years, Miss Simmonds and I kept careful records of all the cages in our rat colony where the eye disease appeared, and were finally led to the conclusion that it appeared only where it could be accounted for on a basis of the lack of the principle which was supplied by certain fats. We hazarded the assertion in 1917 that the eye disease in question was a symptom of a deficiency disease in a sense analogous to beriberi, which Funk and others had previously ascribed to a lack of the special nutrient principle to which he gave the name vitamin.

The nutrient principle referred to as associated with certain fats is now regarded as one of the class of vitamins, and most investigators refer to the vitamins as vitamin A, vitamin B, vitamin C, vitamin D, etc. The vitamin which was found necessary for growth and the maintenance of health, and which was found to prevent or cure the ophthalmia of the type just mentioned, is known as vitamin A. Up to 1921, no careful study had been made of the anatomic changes which develop in the eye structures and neighboring tissues as a result of a lack of the vitamin A. At that time, Dr. S. Mori, chief ophthalmologist of the South Manchuria Railway, came to my laboratory in Baltimore and spent a year in the study of this disease. We prepared for him a long series of rats on diets which were well constituted for the promotion of growth and the preservation of health, except that they lacked the vitamin A.

Dr. Mori studied the eyes of these rats in various stages of specific starvation for this principle. His method involved the removal of the entire content of the bony orbit, its fixation, staining and study of the serial sections. Dr. Mori's results threw new light on what occurs in the development of the ophthalmia of dietary origin. His sections showed clearly that the first change observable is a tendency for the lacrimal gland to go into a resting stage, and to cease to produce

tears. The glands look like resting glands, and not like secreting glands. When the supply of tears fails, the conjunctival sac is no longer washed continuously as under normal conditions, and the result is that bacteria quickly begin to grow in great numbers in the conjunctival sac. This growth stimulates a migration of leukocytes, which accumulate in the eye chambers so that when one looks into the pupil, a yellow spot is often seen. Some of the leukocytes migrate through the outer coating of the eyeball, and thus find their way into the conjunctival sac. Through their dissolution, albuminous material accumulates, which forms a sticky exudate that tends to paste the eyeballs together when the eyelids are closed. The drying of this sticky solution makes it difficult for the animals to get their eyelids separated when the condition is advanced. It was found possible to cultivate ever increasing numbers of bacteria from swabs taken from the surface of the eyeball day by day during the progressive fasting from the vitamin A.

Owing to the dryness of the eye, there is a cornification of the external coating of the eye. The cells become flattened and pile up in stratified form, resembling horny layers of skin. Ulcers regularly form on the cornea during the later stages of the disease, owing to the death of the tissue. These ulcers finally perforate, and the lens pops out.

It is possible to induce spectacular recovery in animals whose eyes are in a very damaged condition by administering fats containing an abundance of the vitamin A. Dr. Mori regards the ophthalmia of dietary origin as the analogue in certain respects at least of a human disease common in many parts of the Orient, and known as hikan. An ophthalmia of dietary origin in which a lack of the vitamin A is certainly the principal etiologic factor occurs frequently in Newfoundland, Laborador and, occasionally, in the United States. I have seen several children who appeared to have undoubted cases of this disease. Dr. Mori called our attention to the fact that many children in the Orient who suffer from an eye condition which is presumably brought on in great measure by a lack of vitamin A suffer from dryness of the mouth sufficiently severe to deprive them of the use of their vocal cords, so that they may go through the facial contortions of weeping, but make either no sound or only feeble squeaks. This suggested a study of the histology of the salivary glands in animals suffering from a lack of the vitamin A. Dr. Mori's sections showed changes in the salivary glands which indicate a cessation of secretory activity. The dryness of the mouth is due, therefore, to a total or partial failure of the function of the salivary glands.

Such histologic studies as have been made on the structures of the alimentary tract other than the salivary glands have not brought to light any pathologic changes either in the stomach, intestines or pancreas.

There is no reason to believe that the pathologic effects of a lack of vitamin A are limited to damage to the lacrimal and salivary glands. Sometime before there is evidence of functional damage to these glands, the animals are evidently affected adversely in general nutrition. They cease to grow, and rapidly develop general signs of malnutrition.

OTHER CHANGES

Evans and Bishop have recently described another pathologic change which seems to be specific for a lack of vitamin A. This pathologic state appears in sexually mature animals, and constitutes a peculiar type of reproductive upset. It seems to involve an impairment of germ cell vigor by a selective ovarian disorder, and is characterized by the continuous production and desquamation of cornified cells by the vaginal mucosa. Fertilization may occur and the placenta may become established, and in some cases the fetus may develop to term. The young are normal, but fewer are born because only a small number of eggs are delivered in one ovulation. The difficulty seems to reside in an ovarian dysfunction, and is distinct, these authors believe, from another type of reproductive disorder, which they attribute to a deficiency in the diet of another principle, and which they have designated by the letter X.

These observations are apparently the only ones that throw light on the specific nature of the pathologic states that may result from a lack of vitamin A. It is not to be inferred from this statement, however, that our knowledge of the rôle which this interesting nutrient principle plays in metabolism is complete. It is significant that the effects observed by Evans and Bishop cannot be detected during the life of the animal previous to sexual maturity.

Some years ago, Mellanby in England conducted a long series of experiments with pups, which he fed numerous diets faulty in different ways. The exact natures of the deficiencies partly or absolute in his experimental diets were never accurately evaluated. Mellanby observed rickets of varying degrees of severity in certain of his experimental animals. A certain number of diets which Mellanby found to induce faulty bone development which he diagnosed as rickets were improved by the addition either of butter fat or of cod liver oil, the two fats rich in vitamin A, so as to prevent the development of rickets in the pups. Since the only special value which had up to that time been attributed to either of these two fats was supposed to result from their content of vitamin A, Mellanby interpreted his experimental data to show that vitamin A exerts a protective influence on bone growth, and acts as an antirachitic substance. Experience has shown that cod liver oil is richer in vitamin A, and serves in smaller doses to prevent or cure the ophthalmia of dietary origin, than does butter fat. Mellanby also observed cod liver oil to be correspondingly more effective in the prevention of rickets than was butter fat.

INFLUENCE OF CALCIUM AND PHOSPHORUS IN THE DIET

During the last few years, Dr. Shipley, Dr. Park, Miss Simmonds and I have carried out a very elaborate study of the relation of the composition of the diet to bone development. In this series, which has involved the feeding of more than 850 different modifications of diet, we have seen striking illustrations of how certain types of faults in the diet may disturb bone development and produce pathologic changes identical with those seen in the bones of human infants suffering from rickets, as well as many variations of this disease from the typical picture.

We are convinced that the absolute amounts of calcium and phosphorus in the diet, and also the proportions between these two elements, exert a profound influence on bone growth. Any diet that is markedly deficient in calcium and contains a disproportionately high content of phosphorus, or a diet that is deficient

in phosphorus and contains a disproportionately high content of calcium, will tend to disturb markedly the developmental process in the bones and shift them away from normal.

This deviation from the normal course manifests itself in a number of ways. The excess of calcium in proportion to phosphorus when the latter is present in the diet in suboptimal amounts greatly stimulates the production of osteoid tissue, and may prevent absolutely the deposition of calcium phosphate in the matrix between the vesicular cartilage cells. In a similar manner, a diet very deficient in calcium but very rich in phosphorus leads to the formation of bone in which much tissue resembling osteoid is formed, and under these conditions, again, calcification of the bone cannot take place, or in certain cases only very irregularly and to a slight extent.

For the development of a histologic picture in bones which is suggestive of rickets, a certain amount of growth is necessary, and the more rapidly growth takes place, the more favorable are the conditions for the development of the rachitic and related pathologic pictures.

I have spoken of diets very low in calcium and rich in phosphorus, or very low in phosphorus and rich in calcium. These represent the extremes in a long series of experiments. Since when either the calcium or phosphorus is deficient beyond certain limits, or when the animal is subjected to gross overfeeding with either of these elements, growth is interfered with, so there are limits to experimental inquiry in both extremes.

We have not yet accumulated histologic sections covering the entire field in which sufficient growth can be induced to produce characteristic bone changes; but with certain contents and proportions of calcium and phosphorus, we have become quite familiar. We are convinced that it is possible to produce two kinds of rickets; one we have designated as a low phosphorus, the other as a low calcium, rickets. It is understood in each case that there is relatively an excessive amount of the element which is not deficient.

EFFECTS OF FATS ON BONE DEVELOPMENT

Our studies have included an inquiry into the effects of several fats on bone development. One of the most striking features of our experience has been the observation that when the diet is so constituted as to furnish approximately the optimal amounts of calcium and phosphorus, the latter in the form of phosphate, it is not possible to demonstrate any beneficial effect of cod liver oil, butter fat or other fats which cannot be attributed to their content of vitamin A. In other words, with a diet appropriately constituted and containing, say, from 0.3 to 0.4 per cent. of phosphorus in the form of phosphate, and approximately 0.6 per cent. of the element calcium, the rat can grow well when he derives his fat-soluble vitamin solely from moderate additions of butter fat, 4 or 5 per cent. With our Diet 3143, which we have described elsewhere, and which contains 1.236 gm. of calcium and 0.291 gm. of phosphorus, a typical picture of rickets develops. This diet contains an excessive amount of calcium. If the calcium content of the diet is reduced to 0.6 or 0.8 gm., calcification begins to be possible, and one sees irregular areas in which calcium phosphate is deposited in the growing region. In other words, Diet 3143 modified so as to contain 0.8 or 0.6 per cent. of calcium, the phosphorus remaining constant, produces some calcification. Therefore, we could not use diets containing these amounts of calcium and phosphorus to test out the antirachitic properties of a selected list of foods. With the higher amount of calcium (1.236 gm.), no calcification takes place in the absence of certain fats, and, accordingly, this diet may be used to demonstrate the antirachitic effect of any list of fats which it is desired to study.

Using our Diet 3143, containing 1.236 gm. of calcium and 0.291 gm. of phosphorus, we find that in from thirty to forty days typical changes characteristic of rickets are seen in the bones. When the animals are in this condition, which we can judge accurately by the peculiar manner in which they use their hind legs, they can be quickly made to initiate the healing process by the administration of certain fats. For example, 2 per cent. of cod liver oil, administered to such rats for a period of six or eight days, leads to the formation of what is known as provisional calcification, in which calcium phosphate is deposited in the matrix surrounding the vesicular cells of the growing cartilage band. This calcium phosphate can readily be made visible by a certain technic in which it is stained with silver. If the same test is made, employing butter fat in place of cod liver oil, it is easily apparent that this fat is not so effective as cod liver oil for causing the healing of rickets. Larger amounts of butter fat and a longer period of time are required before the line of calcium phosphate can be demonstrated along the margin of the vesicular cartilage disk.

Among the various vegetable fats which we have tested, we have found but one which, when fed even in very liberal amounts, and when the time allowed for the initiation of the healing process is greatly prolonged, exerts any beneficial effect on this disease. This fat is coconut oil. Even 20 per cent. of coconut oil produces a much lighter calcification in the bone in fifteen days than is obtained by 2 per cent. of cod liver oil in from six to eight days. Butter fat stands intermediate between these, but is far superior to coconut oil.

Coconut oil we have found to be without value in the prevention or cure of the ophthalmia of dietary origin which we attribute to a lack of the vitamin A. That fat, therefore, is judged to be essentially deficient in this vitamin. It is noteworthy that it exerts quite easily demonstrable beneficial effects in the healing of rickets, and forms one thread of evidence which we have used to weave a three stranded cord of experimental proof that the beneficial effect of any fat on the healing of the rachitic lesion is due to some substance other than vitamin A.

In another type of experiment in which we have fed diets containing suboptimal amounts of calcium, indeed, amounts so small that but little growth is possible, the animals can be made to grow much better by the administration of cod liver oil or butter fat in appropriate amounts. This is a protection to the animals against a deficiency of calcium, and can be explained apparently only on the assumption that these fats provide something which enables the tissues to function more efficiently in the utilization of an adequate amount of calcium than is possible in its absence. We find that butter fat must be fed in much greater quantities than cod liver oil to afford this protective influence in comparable degree.

When coconut oil is tested in this way, we find an increase in the efficiency with which the animals utilize

calcium, but it is vastly inferior to butter fat, which in turn is much less effective than cod liver oil.

Further studies have shown that cod liver oil that has been oxidized for twelve or more hours at the temperature of boiling water by a stream of air bubbles no longer proves effective in the cure of ophthalmia of dietary origin. This we interpret to mean that the vitamin A has been destroyed. Such oxidized fats still prove to be remarkably effective in causing the healing of the rachitic lesion. It appears, therefore, that the substance to which cod liver oil owes its peculiar efficacy in the prevention or cure of rickets is one distinct from vitamin A.

We believe that many, if not all, of the results of Mellanby can be satisfactorily interpreted in the light of this hypothesis. Sherman and Pappenheimer found that a certain diet very deficient in calcium did not produce rickets, but did produce it when a calcium salt was added in certain concentration. They, as well as we, found that rickets could be prevented or caused to heal by the administration of potassium phosphate. We believe that these experimental results can be satisfactorily interpreted in terms of the working hypothesis we have adopted, which postulates the supreme importance of the amounts and ratios between the elements calcium and phosphorus in the diet. In our experiments, we have never seen the rachitic lesion develop when the diet contained what we regard as appropriate amounts of calcium and phosphorus. The bones so produced are not normal in the absence of the organic factor which we regard as this specific antirachitic substance.

Zucker has recently questioned our interpretation, basing his objection on the theory that the beneficial effect of coconut oil in causing the healing of rickets on our Diet 3143 was due to the insolubility of the calcium soaps which might be formed from the high molecular weight of fatty acids of the coconut oil. This he assumes would establish a condition comparable to the feeding of a diet actually lower in its content of calcium since, as he argues, a part of the calcium is thus rendered insusceptible of absorption.

Zucker's comments on our data do not include an explanation of the fact, which is very clearly evident from our experimental data, that coconut oil likewise exerts an easily demonstrable beneficial effect in protecting animals against a deficiency of calcium.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SANSUM, BLATHERWICK AND SMITH; DUKE; EVANS AND BISHOP; TAYLOR, AND MCCOLLUM

DR. GEORGE DOCK, Pasadena, Calif.: The important question for us is, What are we going to do with all we heard this morning? Are we to look on this as pleasing entertainment, or are we going to look on it as educational? If we do not do that, we shall make a most serious mistake. We must remember that we have reached the quantitative period in diet and feeding. Through books, lectures and periodicals, and the extensive work that was carried on during the war, there has been a notable increase of knowledge of what we mean by feeding and dietetics. Calories are pretty thoroughly understood. Balance is not so well understood. In some of the leading restaurants the calories are presented daily on the menu, and it is interesting to see, in talking with strangers in those restaurants, how informed many of them are in these details, which do not detract at all from the pleasure of eating, but rather make it more entertaining than otherwise. It is not difficult to carry the practical knowledge of exact dietetics to patients and relatives, if the physician understands the practice himself. As I have worked for several years in a diet kitchen, it has been most instructive to see wives and mothers from all classes of the population, who work there a week or two, carry out, in the most exact way, the measurement and preparation of foods for diabetic and nephritic patients, and then go home and apply that knowledge, with no loss to the esthetic features of their tables, but with gain to the condition of their patients. Dietetics has long since passed the point at which we can tell patients to eat anything that does not disagree with them, or when we can even give them lists. We have to give them cubic centimeters and grams, and if we know this subject we can have it carried out. If we do not, people will get it somewhere else. A few of them will get it in hospitals where they specialize on those matters. A few of them will get it in dietary clinics. But a great many more will fall into the hands of what might be called "outsiders," very often pseudodietitians, and if that happens, we shall find another large section of the practice of medicine getting out of the hands of physicians and into the hands of other people, and then we shall hear still more talk about the passing of the general practitioner than we do at present.

DR. GEORGE PINESS, Los Angeles: It has been my experience, in the study of many cases, that in about 60 per cent. there is a history of allergy, either on one or both sides of the family, and in several instances we have been able to trace the allergy back several generations in the same side of the family. The question of contact and general sensitive types is of particular importance in diagnosis and should be studied very carefully, particularly in cases with a history of a chronic allergic condition, such as angioneurotic edema or urticaria, and various abdominal manifestations. This type, as a rule, does not give reactions to the cutaneous tests, and many times reactions may be elicited by the intracutaneous tests. These cases differ from the chronic and acute type, such as hayfever and asthma, and other abdominal conditions, such as simulated appendicitis. This type, usually, gives the cutaneous or skin reactions. The work of Dr. Duke has brought out the fact that the field of allergy is much larger, and, therefore, it becomes imperative for a man not to limit his work to one particular type of testing. So, in cases in which one knows that there is an allergy, and is unable to obtain reactions with the cutaneous tests, I would advise that the intracutaneous tests be performed as well. Dr. Duke mentioned appendicitis. I have had two cases of that particular type, and in studying the appendix after its removal there was no definite acute inflammatory condition, except that there was an edema, which I believe is nothing but a cellular edema, which is characteristic of angioneurotic edema, and the edema in hay-fever. The common articles of food are the things that are found in the chronic conditions and rarely in the acute. The irregular attacks of asthma and eczema and edemas and other allergic conditions are, usually, due to the uncommon foods, and with that type of history, a great many times it is a waste of time to test with all the common foods, and the uncommon foods should be tested for, particularly with histories of seasonal attacks. Arthritis, as mentioned by Dr. Duke, I have seen only as a reaction to antigen administered during the course of treatment. Desensitization to food allergy is not practical, because it takes too long to desensitize, and the results are not worth while, although Talbot and others have reported brilliant results along these lines. My experience has been the opposite, and I would suggest that, in an attempt to treat these cases, abstinence from the foods in question will bring far more brilliant results than those in which desensitization is attempted, with one exception, and that is the occupational type, such as bakers and handlers of food. Nonspecific protein therapy, as suggested by various commercial chemical firms, is of no value whatsoever.

DR. E. S. O'KEEFE, Boston: I was particularly interested in Dr. Duke's paper on food idiosyncrasies. In working with infants it has been interesting to note the great relative frequency of the occurrence of sensitiveness to the egg and milk proteins, as compared to the other food proteins. In the breast-fed infants with eczema, 60 per cent. show a positive skin reaction to one or the other of these two proteins. These

proteins have one feature in common, and that is, it is the food for the young of the species. They seem also to have particularly the qualities required for an allergen. I do not feel that this frequent occurrence of allergy in early infancy, as found in the eczemas, is evidence of a congenital allergy, but rather evidence of an allergy which has occurred in the early weeks of life, in which, as Schloss has pointed out, the mucous membranes of the gastro-intestinal tract are especially permeable. Another feature of interest to me is what determines the site of the allergic manifestation. Ingestion of egg may result in eczema in one case; in another, asthma will follow. In infancy, eczema is by far the commonest condition. Later, urticaria or asthma or hay-fever becomes more common. As has been pointed out, local irritation is a factor producing allergic manifestations. In infancy, the commonest site of local irritation is the skin; hence the greater frequency of eczema in the early months, and in the second year, when respiratory affections begin to occur. As the child's life becomes more complicated, asthma becomes more common among the allergic tendencies, and then, as the child goes around playing in the fields and the woods, and is exposed to the pollens, hay-fever becomes more frequent. Dr. Duke spoke of the violent reactions that sometimes occur in testing persons, either by the cutaneous or the intracutaneous tests. I have used the cutaneous method entirely. My work has been mostly among infants under 2 years of age. I have seen no reaction at all violent in its nature.

Dr. M. A. Ramirez, New York: Dr. Duke's division of allergic cases into general and contact cases is a very good one, particularly as it emphasizes the fact that the general cases do not give postive skin reactions in many instances. The contact cases, that is, the cases due to pollens and inhalations of animal dust, usually give a positive skin test. This, as Dr. Duke brought out, is due to the fact that these patients are sensitive, not to the protein molecule itself, as it is ingested, but to the product of protein digestion; and I believe that the product which most usually causes symptoms is histamin. Skin tests with histamin solutions are of doubtful value, because virtually everybody tested will give a positive reaction to histamin. It is somewhat unfortunate that so many men doubt the frequent occurrence of these general allergic reactions. I myself have not seen many bladder cases, but I have seen a great many cases of gastro-intestinal disturbances. Several patients complained of severe abdominal pains, coming on after eating, simulating, in their history, gastric ulcers. On roentgen-ray examination they show a definite pylorospasm, and on skin testing they give positive reactions to one or more proteins. Elimination of these foods from the diet has relieved the symptoms, and follow-up roentgen-ray examinations show a disappearance of the pylorospasm. I do not think that many cases of urticaria are due to specific proteins. As a rule, urticaria cases will react with general symptoms one day to one type of food and the next day to another type. I think that these cases are due to a reaction to a nonspecific protein molecule. They do not, as a rule, give positive skin tests, and while they are not sensitive to the products of protein digestion, they are sensitive in a nonspecific way, and these cases are relieved only by nonspecific desensitization by injection of peptone solutions, or by treatment of the intestinal tract. I think it is an important thing to remember, in the treatment of protein cases, that it is necessary to eliminate the food entirely. If a patient is sensitive to wheat or to egg, he must eliminate not only the egg or the wheat, but everything containing these proteins.

Dr. Seale Harris, Birmingham, Ala.: Dr. Duke says that many food idiosyncrasies are often overlooked. I want to disagree with him, however, on the frequency of idiosyncrasies against milk. I have observed few people who could not take milk. I have seen many who said they could not take milk, and I think it is because they have had some digestive upset in the past, and they lay the blame to milk. Much of it is psychic in character. I have told many patients who said that they could not take milk that we would modify it and suggested that they could digest a little milk, and I find that they do. Then I increase the amount, because those patients are frequently undernourished. Milk is such an important article of diet that we should be absolutely certain of the idiosyncrasy before advising a patient not to use it. The work of Dr. McCollum and many other investigators shows that one of the most important articles of food is milk. Nutrition is the biggest public health problem of this time, because it is back of a great many infections. I have never seen a well-nourished person develop tuberculosis. I have seen very obese persons who had tuberculosis, but they were not well nourished. They were living on unbalanced diets. Clinical observations suggest that milk is the protective food against tuberculosis and many other conditions.

Dr. Myer Solis Cohen, Philadelphia: Will Dr. McCollum state the proportions of phosphorus and calcium that he finds optimum, as an antirachitic measure, or the proportions that he finds most favorable in regard to the production of rickets, and also how, in human feeding, the bad proportions are to be avoided and the good proportions maintained? Concerning food idiosyncrasies: "Idiosyncrasy" is one of those comforting words with which physicians are accustomed to translate their ignorance into Greek. Thirty years ago I read before the first Pan-American Medical Congress a paper entitled, "The Vasomotor Attacks," a contribution to the subject of idiosyncrasy. The paper encountered a great deal of skepticism, and, laterly a good deal of neglect, but I would ask you who are now studying the subject of idiosyncrasies to read it. In that, and subsequent communications, I think I have demonstrated that three factors enter into what we are pleased to term idiosyncrasies, hypersensitiveness, allergy and other seemingly meaningless terms. The three factors are, first, a fundamental liability with which the patient is born. It may be hereditary and usually is. It may only be congenital, and it is commonly exhibited in many members of the family, and in many of the families of the clan. In my paper, I traced a number of American families back for six generations. "Liability" is no more comforting than "idiosyncrasy," but let us try to find out in what that liability consists. A fundamental liability, first; an excited liability, second; and, third, a determined liability. All three of these are to be sought. We know the excitants better than we know any other factor. The excitant may be trauma, pulmonary, chemical agents, chemical agents introduced from without or chemical agents generated within the body through excess, deficiency, or perversion of the normal physiologic products. Emotion is a well recognized excitant. The determinants may consist in anatomic peculiarities, the shape of the nose, the curve of the arm, various factors of that kind. They are largely to be discovered, though some may be found. The fundamental liability, which is not only exhibited in hay-fever and asthma and certain forms of visceral angioneurosis, may simulate renal colic, or appendicular colic, and has been proved, again and again, to depend on an angioneurotic change in the appendix or in the bile ducts, or whatever other structure is affected. These idiosyncrasies are widespread and include many factors, and we must seek their explanation in a study of the autonomic endocrine subject, considered as a whole.

Dr. F. M. Pottenger, Monrovia, Calif.: Dr. Sansum's discussion of the acid-base equilibrium of the body is of great importance in understanding disease processes. When the acid-base equilibrium of the body shifts, the reactivity of the cells changes. The alkali balance of the body is of extreme importance in conditions of food sensitization. Dr. Duke stated that food idiosyncrasies appear in childhood. In my studies on visceral neurology I have learned that the action of the nerve is not fundamental. I have learned that there is something back of the secretion of an organ or the contraction of a muscle. This something seems to be the condition of the cell itself. The collodidal phases of the cell itself change under varying conditions, and so does its content in ions; and its reactivity varies with these changes. The foundation for this work was laid by Ringer in 1881, 1882 and 1883 by his work on the heart. He showed that calcium added to physiologic sodium chlorid solution caused much the same action on the heart as stimulation of the sympathetic nerve, and that potassium caused much the same action as stimulating the vagus nerve. Through work of many other physiologists we now know that calcium in the cell is an essential part of

sympathetic action, and that potassium is an essential part of parasympathetic action. This holds not only in the heart but also in the gastro-intestinal tract, the respiratory tract, and many other systems of the body. Allergy in all visceral tissues seems to be accompanied by a preponderance of parasympathetic stimulation, and certain changed conditions in the content of the cell seem to be necessary to this parasympathetic action. This offers an explanation of the fact that one patient becomes sensitive to a food when others will not. One will have asthma and hay-fever when others will not. A most important piece of work for clinical medicine would be for biochemists and physiologists to connect up all the parts of the neurocellular mechanism; the cell, the factors that change it, and the nerves that act on it. Dr. McCollum's suggestion that reproduction depends on food substances is an important contribution to science. It would be a great thing if physicians could train themselves to think in terms of physiology and biochemistry instead of anatomy. A disturbed function should always be considered in the light of the entire mechanism that is responsible for that function.

DR. LULU HUNT PETERS, New York: I am in a position to know that many general practitioners do not know about ordinary dietetics. We have known for years that rickets had something to do with dietetics, but we have not appreciated what normal dietetics meant for normal health. I am interested in the subject of weight reduction. I believe that if more of us would concentrate on the question of normal weight, we would do a great deal, in preventive medicine. This is a question, ofttimes, of sterility. I have found in my work that many of my overweight patients who reduce their weight have become pregnant afterward. Dr. McCollum and I have had a little set-to on the question of calories; but I think that we understand each other. He maintains that the average person does not need to have a knowledge of calories, but, of course, there are so few average persons. Three fourths of our adult population are overweight.

DR. W. D. SANSUM, Santa Barbara, Calif.: I wish especially to call attention to Dr. Taylor's group of essential foods, milk, vegetables and fruits. Milk has a high caloric value. Its protein is exceptionally efficient, and it is rich in vitamins. Fruits and vegetables contain the necessary bulk for the proper management of the bowels. Their basic properties, mineral food and vitamin content are high. We believe that the acid-base balance of food should command more attention in the future. Sherman and Gettler have done considerable work on this problem, and Dr. Blatherwick in his army experience appeared to obtain excellent results when sufficient basic food was added to the soldiers' diet. Fruits and vegetables are bulky and hence hard to transport, and it is frequently difficult to teach patients to eat them in sufficient quantities. We do not believe that nephritis per se is responsible for the abnormally acid urines frequently found. We have observed that a nephritic diet, although often meat-free, is high in cereals, and we believe that the cereals are more responsbile for the acid urine than is the nephritis itself.

DR. W. W. DUKE, Kansas City, Mo.: A decade ago, it would have seemed almost beyond the limit of our imagination to believe that, through the removal or addition of traces of common foodstuffs to diet, we could influence not only health but also growth and finally reproduction. I have been acquainted with Dr. McCollum's views for a number of years, and used them to great advantage in my work. I have had the opportunity recently of visiting Dr. Evans' laboratory; and, after seeing the care and thoroughness with which his work is carried out, I came away proud of the fact that I am one of his friends and classmates.

DR. A. E. TAYLOR, Stanford University, Calif.: I wish to give one illustration confirming Dr. McCollum's position with respect to the particular activity of marine fats on bone lesions. In the work of the American Relief Administration in central Europe, a tremendous amount of bone affliction was encountered. When the Relief went first into Russia it encountered, in spite of severe famine, a surprisingly small amount of these bone lesions. The explanation was that the Russians had, as one of their few supplies, dried herring from the Caspian Sea. Two or three times a week these children were issued one dried herring. The children ate these dried herring—head, entrails, liver, tail and all. To this we ascribed, and I am sure correctly, the relative freedom they had from bone afflictions on a diet which was, otherwise, just as bad as, or worse than, the diet of their neighboring children to the west, who suffered severely from bone softening.

DR. HERBERT EVANS, Berkeley, Calif.: The great field opened up by the labors of American biochemists, chief among whom must be numbered Dr. McCollum, and Drs. Osborne and Mendel, has, of course, made possible what we have been able to achieve. We have applied that knowledge and method of study to the function of a specific organ, perhaps using for the recognition of that function methods of greater precision than those hitherto available. I want to say one thing in regard to the synthesis of the so-called vitamins. It appears not to be realized that, within the last year or two, physiologic botanists have demonstrated that one can rear at least three generations of cereals in every respect normal in water cultures and with artificial light. We have now an unusual opportunity to test the effect of physical factors on the synthesis of vitamins. We have been able to confirm the English work in regard to the synthesis of vitamin A by plants in such water cultures and have likewise found there the new substance essential for reproduction.

DR. E. V. MCCOLLUM, Baltimore: I have been asked to tell something that I am unable to; namely, just what dietary conditions are at fault in inducing rickets in children. I am not a clinician. However, I can answer definitely the question as to what constitutes the optimal amount of calcium and of phosphorus in the diet. The phosphorus content, to be optimal, should be somewhere around 0.35 or 0.4 per cent. of the food mixture. The calcium content to be optimal should be approximately 0.6 or 0.65 per cent. of the diet. In other words, we need a little more than half as much phosphorus, on a weight basis, as we need of calcium. Of course, when we observe carefully and histologically the bones of a large series of animals whose diets vary in these two elements, over a wide range, we find certain specific and distinct pictures. As we deviate from these experiments into the middle field, we find borderline conditions which are not so specific, and which one cannot count on observing with certainty in every animal in a series. I would emphasize, in connection with infant feeding, that disturbed assimilation may be the equivalent, in its effects, of a quality content of the diet in those respects which would disturb bone growth. There can be no question, I believe, that mothers have been discovered in Baltimore and in New Haven, who have nursed infants, nursed them exclusively so that the exclusive source of their food was the mother's breast; yet those children have developed rickets. I cannot go into that aspect of the subject, as to the kind of diets those mothers were on, because Dr. Power has done that work; but it is an interesting commentary which I believe I may make, that the nursed infant is not necessarily protected, unless the mother's diet is so constituted as to make a milk that is satisfactory. Dr. Harris asked for information concerning the effects of a lack of vitamin A on the liver, the pancreas and other structures. Investigations on this subject have been under way for more than two years, but the task is one of great magnitude, and we must have more time in order to gain all the information that we need. Before an animal exhibits the specific signs of malnutrition due to lack of vitamin A, it suffers more or less generally.

Rest in Tuberculosis.—Rest remains the sovereign remedy for tuberculosis. More direct and spectacular methods of treatment—inhalation, injections, drugs by mouth—come and go: the years since 1900 have spawned hundreds of them. Few have survived the momentary sensation of their announcement; none has earned even a vogue; all this despite the fact that none has been employed unless rest were also a part of the treatment. Rest alone has returned thousands of consumptives to productive life. Of those who, while living an active life, relied on drugs or vapors or "serums" or vaccines to fight their battle, few have made the journey back.—A. K. Krause: Rest and Other Things, p. 11.

THE RELATION OF RIGHT-SIDED ABDOMINAL PAIN TO RIGHT-SIDED DISEASE *

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Pain in the right side of the abdomen is one of the most frequent phenomena encountered by the clinician in the routine examination of patients. This is due in a large measure to the fact that there are several organs located in the right side of the abdomen which seem especially liable to disease. These are the gallbladder, head of the pancreas, right kidney, appendix and right ovary.

Much of the pain encountered in the right side of the abdomen is due to organic disease of one of these organs. As knowledge of these diseases has developed in the past, these organs alternately from time to time have been held responsible for most of the pain encountered in the right side of the abdomen. Two points of view have been held. One is that practically all the real pain in the right side of the abdomen has been due to organic disease, and some surgeons accordingly have removed organs located on the right side of the abdomen at the slightest provocation or excuse. Those holding this view have been sadly disappointed in the result, and this disappointment has led to another view, which holds that the real pain is due to organic disease but that there are many imaginary pains found usually in neurotic patients and located in the right side of the abdomen, and that such pains are not for the surgeon but for the neurologist to treat. Therefore, surgeons holding the latter view claim to be very conservative. They remove only those organs actually diseased and close the patient's abdomen without doing anything further. These patients are thereby consigned to a life of suffering which, in my opinion, is just as real and just as well founded as organic disease. These pains can usually be relieved just as certainly by physical and surgical measures as can the definite organic diseases.

It is right and proper, in my opinion, that a conservative surgeon should decline to remove a normal appendix, a normal gallbladder and normal ovaries in which pathologic changes cannot be demonstrated either macroscopically or microscopically. It is my opinion that in the not distant future a surgeon who opens an abdomen for right-sided pain and, on not finding an organic lesion sufficient to justify the removal of an organ, closes the abdomen without further investigation and in many cases further operation, will likewise be condemned.

Twenty-five years ago, the woman complaining of chronic right-sided abdominal pain had the right ovary or possibly both ovaries removed, with no relief. A few years later she had the appendix removed, and in most instances had no relief. She then had the right kidney fixed, with no relief. In certain instances she had a gastro-enterostomy performed, many times with disastrous results or with no relief. In more recent years she has had a perfectly good gallbladder drained or removed, with no relief.

In 1908, Wilms reported forty cases in which he had fixed a movable cecum for the relief of chronic appendicitis and expressed the belief that in many cases of supposed chronic appendicitis the symptoms were due in most cases to gynecologic or neuralgic conditions or to an abnormal mobility of the cecum.

Klose began to study these cases about the same time and went a step further by promulgating the view that the mobility of the cecum was an index of defective development, which might not cause any disturbance in some cases, but, on the other hand, might produce colics and inflammation which he said would be remedied by a simple intraperitoneal colopexy.

In the hospital reports of a few years ago, the tables showed from two to four operations for chronic appendicitis to one of acute appendicitis. This has been changed, until now a well-conducted surgical clinic operates in more acute than in chronic cases.

Gibson [1] reported that in the First Surgical Division of the New York Hospital, operation was performed in 555 cases of chronic appendicitis and 820 of acute appendicitis.

Lichty,[2] in discussing chronic appendicitis, called attention to the large percentage of patients with pain in the right side who were most frequently operated on for appendicitis but in whom the disease was not manifest at the time of operation. In 517 consecutive cases compiled from a general and consulting practice, in which the patients had already been operated on for various conditions and in whom the complaints "after the operation were the same as before the operation," 243 had been operated on for chronic appendicitis. Of the remainder, seventy-eight were operated on for appendicitis and pelvic disease; forty-four for appendicitis and gallbladder disease; forty-seven for gallbladder disease only; forty-one for pelvic disease only; sixteen for gastric ulcer only, and thirty-nine for promiscuous conditions, including all kinds of operations. He thinks it is probably safe to say that not more than 60 per cent. of the diagnoses for chronic appendicitis are justifiable clinically. Sixty per cent. of his series of 1,320 cases of chronic appendicitis showed fairly good results, but he makes the significant remark that even some of these patients were not cured but were better than before operation.

My associate, Dr. Sears, some time ago went over many of our records and found that, of the patients going through our clinic for routine examination who had had the appendix removed for chronic appendicitis elsewhere, 70 per cent. had not been benefited. In going over our statistics and many of our histories, I have been convinced that more than half of the patients coming with chronic right-sided abdominal pain have no definite organic disease. But let us suppose that 50 per cent. have definite organic disease. Those having organic disease we will leave out of this paper and assume that the modern clinics will detect them. Our discussion in this paper we will therefore limit to chronic right-sided abdominal pain not due to organic disease. Many of these cases are treated or maltreated under the name "neurasthenia."

Lichty very wisely says, "It is not unlikely that many of the patients that the late Dr. S. Weir Mitchell treated so successfully with his system of 'rest cure' were cases which we now are too prone to call chronic appendicitis and are attempting to cure by operation."

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

1. Gibson, C. L.: Am. J. M. Sc. 159:654 (May) 1920.
2. Lichty, J. A.: Chronic Appendicitis, J. A. M. A. 79:887 (Sept. 9) 1922.

A study of this class of cases for more than twenty years has left me with the firm conviction that a very large percentage of chronic right-sided abdominal pain is the result of defective fixation of the ascending colon.

DEFECTIVE PERITONEAL FUSION

Anatomists and embryologists inform us that from 20 to 40 per cent. of persons have defective peritoneal fusion. In such persons, the large intestine, particularly on the right side, has a mesentery more or less like the arrangement of the intestine in the quadruped. Waugh calls attention to an investigation made by an associate of his, Dr. Pirie, in a series of postmortem examinations made on children under 12 years of age at the Great Ormond Street Hospital for Sick Children in London. He found, just as other anatomists have found, that there was a primitive mesentery or a portion of it in 20 per cent. of all patients examined, irrespective of the diseases from which they died. Therefore, 80 per cent. started life with no remains of a primitive mesentery. In other words, 80 per cent. had normal fixation of the ascending colon.

Nonfusion on the left side has but little bearing on the subject under discussion; therefore I shall devote my attention to nonfusion on the right side.

There are, of course, a great many variations in the type and extent of nonfusion. I have divided right-sided nonfusion into four arbitrary types, all of which have been seen personally by me and pictured by Mr. Trahar.

1. First, I will mention the type nearest to normal; namely, a simple mobility of the cecum with normal fixation of the ascending colon. It is probable that this type of case in a patient with ordinary normal intra-abdominal pressure rarely gives trouble. However, it is occasionally found that in such a case the cecum becomes distended, probably by gas and habitual constipation, falls over into the pelvis, and develops pathologic conditions, including the formation of membranes.

2. The second degree of nonfusion is probably the one that creates most trouble. In this case, the colon has rotated over as far as and has become attached to the front surface of the kidney, the rest of the ascending colon and cecum remaining mobile.

3. The large intestine has apparently not rotated over farther than the front surface of the duodenum, to which it attaches and hangs as a dead weight, all of the ascending colon and cecum having a long mesentery. The kidney is exposed.

4. In the fourth type of nonfusion that I have described, the ascending colon has not fused to the parietal peritoneum, and the kidney and duodenum are entirely exposed, just as in the quadruped. Floating kidney is rarely seen in either Type 3 or Type 4, lending much evidence to Longyear's theory that the kidney is dragged out of its position by an attached colon.

From these four stages, or types, there are an infinite number of gradations, even to the extremes of nonmigration of the cecum from the left side, and in one personal case, there was extension of the duodenum down around the end of the cecum, just as it is found in the dog. It is unnecessary to relate all these variations in the development of the general conception.

Pain resulting from defective peritoneal fusion is directly produced in two ways: (1) by distention of a mobile prolapsed cecum, and (2) by traction on acquired membranes or bands which help to carry the weight of the organs below.

Acquired membranes and bands referred to by Lane constitute a very bewildering subject when one studies the literature in general. Certain observers, basing their conclusions on postmortem examinations held on the cadavers of new-born babes, have noted the frequent occurrence of membranes and peritoneal folds at the beginning and ending of the fused peritoneal areas, and believe that all noninflammatory membranes and bands found in the abdomen are congenital. Others are equally positive that they are all acquired. The every-day practical surgeon, seeing the results of acute inflammatory conditions, believes that they are all inflammatory.

There are certain unusual membranes occurring around and below the ileocecal junction, around the beginning of the jejunum and at the beginning of the second portion of the duodenum which are congenital and represent anomalous fetal developments. It is significant that these congenital membranes develop only at the beginning or ending of a fused area, which indicates that they are probably peritoneal remnants in the process of a normal or possibly excessive prenatal fixation. Such membranes, as a rule, perform no function, do no harm, and have no special significance in connection with this subject.

Then there are bands and membranes which have resulted from inflammatory processes particularly around the ileocecal and appendical region, the pelvic colon and generative organs and in the neighborhood of the gallbladder, which are produced in response to an infectious process having its origin in these organs. These bands and membranes are purely inflammatory in origin, and represent a residue of reparative or protective material. Such bands or membranes have no definite direction, have ceased to function, and have no bearing on this subject except so far as they produce mechanical obstruction or pain by incidental suspension of a prolapsing organ.

These two kinds of membranes must be sharply differentiated from those conservative membranes which have been referred to as acquired membranes. Such membranes were noted by J. W. Long, Lane and other authors many years ago, but it was left for Jabez N. Jackson of Kansas City to describe exactly the pathology of such a membrane. I was fortunate enough to be present when Jackson presented his original report, in 1908. This description of Dr. Jackson and Dr. Frank Hall will always remain as one of the classics of surgical literature. Dr. M. L. Harris has made a valuable contribution to the description of the process of the formation of these membranes.

I am very certain that these acquired membranes are rarely seen except when defective peritoneal fusion is congenitally present or when certain portions of the alimentary canal have a defective support. I believe, with Lane, that these membranes are crystallized lines of force laid down in response to a strain or a demand for help by the supporting tissue. Therefore, their purpose is conservative and beneficent. They are laid down for the purpose of remedying a defect in embryologic development in most instances. If the development of the membranes has been symmetrical, they often serve the purpose for which they were called out in a satisfactory manner, and produce no pain. Unfortunately, these membranes frequently develop

unevenly, and their forces are concentrated in small, firm bands. In this instance their support is confined to narrow limitations in which the pull becomes definitely localized in one place, which in turn calls forth more material for crystallization and for strengthening this one place, and which in turn creates a stronger local pull and so a vicious circle is established and chronic pain is induced. Lane has given a most satisfactory description of the scientific principles underlying the development of these membranes. While holding the opinion that Lane is right, it was in the first place very hard to get the explanation.

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7. Another extending from the colon across the duodenum, making extra fixation.

8. A midline ptosis probably due to dilatation of the stomach, secondary to dilatation of the duodenum, which was produced by duodenal arteriomesenteric ileus.

All these, when taken with the history of the case, make a complete clinical and pathologic picture of right-sided ptosis.

This case represents the pathologic condition and symptoms that can occur in a given case of right-sided ptosis with painful bands, and represents an extreme type of right-sided pain due to inorganic disease. As a rule, however, only a part of this picture is shown in the same case. For instance, it is often true that a completely mobile colon with an unlocated hepatic flexure will have no membranes and no peritoneal fusions at all, and will probably have much less pain than will be found when partial fixation has taken place. Many of the patients have a fixed hepatic flexure with a pendulous cecum and ascending colon, which hang down in a baggy fashion and in which the pain is located apparently in the cecum itself. In other cases, the hepatic flexure is lost, and the tip of the appendix is attached up under the right lobe of the liver and is acting as a ligament. This is one of the frequent causes of a painful right side. In other instances, the cecum and ascending colon are entirely movable, and strong acquired bands pass upward on the surface and edge of the omentum and extend up along the under surface of the gallbladder and pull on its tip and under surface. At other times the supporting acquired band extends along the omentum over the first part of the transverse colon up across the duodenum, making a definite band across this point. This gives definite right-sided pain with gastric symptoms. Cases in which the band attaches to the gallbladder give chronic gallbladder symptoms. The cutting of these membranes gives temporary relief, but the pain usually returns with the reforming of bands. Supporting the colon by shortening the mesentery of the ascending colon, extending a line of sutures around the hepatic flexure and attaching the mesentery and omentum to the parietal peritoneum will relieve the patient permanently, as a rule.

The differential diagnosis between this pain and an organic lesion is that the pain is usually worse while the patient is up and about. At first it is quite inconstant and erratic, but in its later stages is constant, or at least comes on nearly every day, while in organic disease the pain usually comes on in definite attacks alternating with free intervals. In other instances there is a very firm fixation of the hepatic flexure, with a drag on the kidney which often produces a floating kidney. According to Longyear, the kidney has been pulled out of its bed by the weight of the loaded cecum. One of the most frequent bands along the cecum is one starting from the lateral parietal peritoneal wall at a point corresponding to the usual attachment of the hepatic flexure and extending diagonally forward and inward and attaching itself to the longitudinal muscular bands of the cecum. When the patient is standing, this attachment is usually located at the psoas outlet, which is the narrow space between the crossing of the psoas muscle and the anterior abdominal wall. It seems that the pressure on the intestine between the front abdominal wall and the psoas muscle may have something to do with the development of these membranes. In such cases as this the pain when first starting is intermittent, intermissions becoming less until finally the pain becomes constant when the patient is on the feet. Pain accompanying this condition usually extends from McBurney's point backward toward the kidney and corresponds to the attachment of the membranes after they have developed.

Forced feeding and fattening will relieve a certain number of these patients of their pain, but painful conditions of the right side of the abdomen are usually best treated by surgical measures, and surgical measures usually consist in shortening the mesentery of the cecum and ascending colon and fixing it to the posterior lateral parietal peritoneum by interrupted sutures without actually sewing the intestinal wall. At the hepatic flexure, the line of interrupted sutures is gradually brought forward on the lateral parietal peritoneum, picking up the mesentery of the colon, attaching it to the front wall until the beginning of the omentum is reached, when the omentum is attached to the anterior abdominal wall over as far as the midline and sometimes 3 or 4 inches beyond.

In cases of extremely dilated and baggy cecum, it is wise to plicate the cecum for the purpose of narrowing and shortening it, as I [5] have described elsewhere. The results are surprisingly good. In some cases Waugh's improvement of the Wilms operation is the one of choice.

At present I do not hesitate to operate for long continued, annoying right-sided pain with the positive assurance that in a majority of all cases I shall be able to relieve the pain whether it is due to organic lesions or to inorganic disease accompanying defective peritoneal fusion.

ACHLORHYDRIA IN GALLBLADDER DISEASE *

GATEWOOD, M.D.
CHICAGO

Owing to the frequency of epigastric distress in gallbladder disease, the notion has crept into the minds of many medical men (Simnitzky,[1] Griffiths [2] and others) that hyperacidity is apt to be an accompaniment, if not a symptom, of cholelithiasis. That an absence of free hydrochloric acid, or an achylia, more often exists does not seem to be generally recognized, although a number of articles have appeared, from time to time, calling attention to it. Leva,[3] in 1893, was the first to note achylia in patients with gallstones, but the number of his cases was small and part of them so complicated that he drew no conclusions. Little is to be found in the literature following Leva's report until Glaser's [4] work in 1905. He stated that hypochlorhydria was of frequent occurrence in the patient who had presented gallstone symptoms for a long time. Hohlweg's [5] reports in 1910 and 1912

5. Coffey, R. C.: Monograph on Gastro-Enteroptosis, New York, D. Appleton & Co.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

1. Simnitzky: Berl. klin. Wchnschr. **38**: 1077, 1901.
2. Griffiths, H. E., Lancet **1**: 265-271 (Feb. 10) 1923.
3. Leva: Arch. f. Anat. **132**: 490-501, 1893.
4. Glaser, R.: Wien. med. Wchnschr. **55**: 1430, 1905.
5. Hohlweg: Deutsch. med. Wchnschr. **36**: 2220, 1910; Deutsch. Arch. f. klin. Med. **108**: 253-276, 1912.

stimulated more systematic research, and a number of excellent articles have appeared since (Rydgaard,[6] Rohde,[7] Wohl[8] and Dangschat[9]).

Most foreign authors have considered achylia and achlorhydria as synonymous terms. Achylia gastrica, however, should be defined as an absence of all gastric secretion, that is, lack of ferments as well as an achlorhydria. While it is reasonably safe to conclude that achylia existed in those patients whose total acidity was 15 or less, nevertheless the proof is wanting unless milk curdling tests have been made whenever free acid is absent. This has not been a routine practice in our clinic, and I have therefore chosen the title, "Achlorhydria in Gallbladder Disease."

The gastric analyses on which this report is based have been made in the usual manner, that is, an Ewald test meal of bread and water was aspirated at the end of from forty-five to fifty minutes except in the occasional case in which emptying was so rapid that a second meal had to be given. In those cases, the meal was removed at the end of thirty minutes. Dimethylamido-azobenzol was used to indicate the presence of free hydrochloric acid and phenolphthalein for the determination of the total acidity.

In order that my statistics may be comparable with those of Rydgaard, Fenger,[10] and others, I have classed as hyperacid (H) all cases showing more than 60 points

TABLE 1.—*Frequency of Achlorhydria*

	Men		Women		Total		Gatewood, %	Rydgaard, %	Fenger, %
	No.	%	No.	%	No.	%			
H.....	6	9	6	5	12	6			
N.....	36	51	58	48	94	49	55	58	55
S.....	11		18		29	15			
A.....	17	40	40	47	57	30	45	47	45

of free hydrochloric acid; as normal (N), those from 15 to 60; as hypo-acid or subacid (S), those from 15 to 0, and as achylorhydric (A), those with no free acid.

The data were obtained from the records of 500 patients operated on in the Presbyterian Hospital, Chicago, and definitely proved to have had cholelithiasis. In only 192 of these were there records of test meals, the presumption being that, in a little over three fifths of the patients, the diagnosis was so definite that stomach analyses did not seem to be warranted. While there was some slight variation in the acidity when repeated test meals were made, no patient showed achlorhydria in one examination and a normal acidity at another. Of these 192 patients, seventy were men and 122 were women. Their ages varied from 21 to 83, the average being a little over 46. The average age of the patients with achlorhydria was 47, or less than a year more than the general average. The relative frequency is shown in Table 1.

Thus, it appears that fifty-seven patients, or 30 per cent., have achlorhydria, and twenty-nine, or 15 per cent., hypo-acidity, giving a combined total of 45 per cent., or identically the same figures as Fenger obtained in his series of 115 cases, and 2 per cent. less than Rydgaard found in 158 cases.

Grouping these cases according to age, we find, as shown in Table 2, that lessened acidity occurs most frequently in patients over 60 years of age (68 per cent.), and least frequently in the fourth decade. We may disregard the results obtained in patients over 60 years of age, since it is pretty definitely established that achylia is quite frequent in patients of that age.[11] Patients from 20 to 30 years old showed a

TABLE 2.—*Age Incidence*

	20 to 29		30 to 40		40 to 50		50 to 60		60 or Over	Total	
	No.	%	No.	%	No.	%	No.	%			
H.....	3	..	4	..	3	..	1	..	1	11; age unknown, 1	
N.....	11	..	25	..	30	..	22	..	6	94	HCl 23, T. 46 at 83 years
S.....	3	43	8	38.3	6	25	7	55	5	29	69%
A.....	7		10		5		19		16	57	
Total	23		47		44		49		28	191 + 1 age unknown	

diminished acidity or an achlorhydria in 43 per cent. of cases, showing that the incidence is not proportionate to the age of the patient and apparently indicating that age has no great influence on the incidence of the achlorhydria.

It has been impossible to draw any definite conclusions from our statistics as to whether stone impacted in the cystic duct was a real factor in producing achlorhydria. Of twenty-three cases of stone in the common duct, nine (39 per cent.) showed no free acid, and three (13 per cent.) were subacid, making a total of 52 per cent. (Rydgaard found 54.5 per cent. subacid + achlorhydric in twenty-two common duct cases). In this small series, jaundice also seems to have had but little influence, those without jaundice seemingly being more apt to develop anacidity. Of thirteen patients with common duct stone and jaundice, seven, or 54 per cent., had a normal or hyperacidity, and six, or 46 per cent., were subnormal or achlorhydric. Of the common duct patients without jaundice, there were ten. In four (40 per cent.) of these, a normal or hyperacidity was found, and in six (60 per cent.), a hypo-acidity or anacidity.

Hohlweg,[5] who, I believe, was the first to consider the question of achylia or achlorhydria following the loss of gallbladder function, proposed a theory based on some animal experiments, in which a loss of action of the sphincter of Oddi followed cholecystectomy.

TABLE 3.—*Common Duct Cases**

	No.	Per Cent.	No.	Per Cent.	No.	Per Cent.	
H.....	1	54	1	40	2	8.7	48%
N.....	6		3		3	39.3	
S.....	1	46	2	60	3	13	52%
A.....	5		4		9	39	

* Jaundiced, 13; not jaundiced, 10; total, 23.

This permitted an abnormal flow of the bile into the duodenum following the removal of the gallbladder, and he believed this was responsible for the diminished hydrochloric acid secretion. Rost[12] found that, following cholecystectomy, the bile was not always discharged continuously into the duodenum. He showed that there was a lessened liver and pancreatic secretion

6. Rydgaard, F.: Arch. f. klin. Chir. **115**: 511-530 (March) 1921.
7. Rohde, C.: Arch. f. klin. Chir. **115**: 727-743 (March) 1921.
8. Wohl, M. G.: New York M. J. **105**: 347-349 (Feb. 24) 1917.
9. Dangschat: Beitr. z. klin. Chir. **128**: 605, 1923.
10. Fenger, M.: Hospitalstidende, **62**: 1305, 1919.
11. Liefschütz states that 33 per cent. of men over 60 years of age have achylia.
12. Rost: Mitt. a. d. Grenzgeb. d. Med. u. Chir. **26**: 710-770, 1913.

in cholecystectomized animals, and concluded that this lessened secretion was responsible for achylia. Rovsing's [13] hypothesis is that in some patients following cholecystectomy an incontinence of the sphincter develops, followed by achylia, while in other patients, the function remains and they continue to have a normal acidity. All of these theories depend on the supposition that there is an activating substance (a hormone) produced somewhere in the bile tracts or in the duodenum by the action of the bile, which is essential to the stimulation of the acid-forming cells of the stomach. This substance is destroyed in gallbladder disease or by cholecystectomy. According to Carlson,[14] the presence of such a gastrin has not been definitely demonstrated. In one of our patients, in whom the gallbladder was evidently entirely destroyed and who had been jaundiced for a number of months from common duct obstruction, the gastric acidity was normal. It would be difficult to explain these findings on the hormone theory, and I can see no reason why it is necessary to assume that one exists. I think it quite as easy to believe that the achylia and achlorhydria which so often occur are a reflex due to the common innervation of the gallbladder and the stomach. I believe that in most patients the resulting anacidity is temporary; but when it has persisted for a sufficient time, it may be permanent.

TABLE 4.—*Gastric Acidity Following Cholecystectomy*

Case No.	Date of Operation	T — Free HCl	Date of Return	T — Free HCl
1	1912	65 — 35	1922	66 — 22
2	Jan. 1923	54 — 15	Oct. 1922	22 — 18
3	1922	44 — 30	June 1923	42 — 18
4	April 1922	28 — 0	Jan. 1923	30 — 0
5	1913	43 — 14	1917	20 — 0
6	1909	33 — 2	1914	50 — 25
7	1917	85 — 60	Jan. 1914	16 — 0
			1916	8 — 0
			1923	60 — 48

Rydgaard strongly advises against cholecystectomy on the ground that achylia almost invariably ensues. I have been able to find the records of only seven patients who have had gastric analyses before and after cholecystectomy (Table 4). Three of these had normal acidity both before and after operation, the time elapsing varying from three months to ten years. One patient had an achlorhydria at operation and also nine months later. The fifth had a normal acidity at operation and an achylia four years later, while the sixth had an achlorhydria at operation and a normal acidity five years later. The seventh had a hyperacidity prior to his operation. At operation, a stone was found firmly impacted in the cystic duct. Shortly after operation, he developed an achylia which persisted on repeated examinations for at least three years; ten years after his operation his stomach findings were normal. Dangschat, in a series of nineteen cases, found that the stomach acidity remained the same before and after cholecystectomy in thirteen instances; three patients having achlorhydria before operation were normal later, while two who were normal before operation were achlorhydric afterward.

What conclusions can we draw from these seemingly confusing data? The evidence obtained from this small series as well as that presented by Dangschat goes to show that instead of a constant achlorhydria after cholecystectomy, as maintained by Rydgaard, in the majority of patients the acidity persists unaltered after operation, and occasionally there is a return to normal after removal of the gallbladder in patients who have previously had no free acid. There is no doubt that achlorhydria and achylia sometimes do follow cholecystectomy, but this condition may not be permanent. Normal acidity has returned in one of our cases more than three years later (Case 7, Table 4). Animal experimentation is very unsatisfactory, for in dogs, at least, the stomach findings obtained by the use of a bread and water meal, aspirated with a stomach tube, are quite variable. Although it has been contended that achlorhydria invariably follows cholecystectomy in dogs, Dangschat found in two animals that, while the acidity was lowered, it remained present. In two animals from which I removed the gallbladder, I found practically the same acidity both before and after operation. In order to arrive at any definite conclusions from animal experiments, it seems to me that it will be necessary to make Pawlow pouches and obtain pure gastric secretion in that manner. (I am just beginning some experiments along this line.) It seems to me that the evidence obtained from this series of examinations goes to show that achlorhydria does not follow cholecystectomy frequently enough to influence one against removing the gallbladder in case of definite pathologic changes.

I may say that, instead of a hyperacidity, as Griffiths has found, a hypo-acidity or achlorhydria existed prior to operation in 45 per cent. of 192 gallstone cases. This may be temporary or permanent. While it may not be of great diagnostic value, especially as achylia not infrequently occurs in a number of other diseases and rarely even in ulcer,[15] it presents an aid in obscure cases, especially in young patients.

CONCLUSIONS

1. Achlorhydria or hypo-acidity occurred in 45 per cent. of 192 patients with gallstone disease.

2. The incidence of achlorhydria is not significantly influenced by age, jaundice, or by the location of the stone.

3. Achlorhydria does not follow cholecystectomy frequently enough to justify abandonment of the operation in the presence of a definite pathologic condition.

4. Achlorhydria, or absence of free hydrochloric acid, is of definite value as a diagnostic aid in doubtful cases of upper abdominal disease.

13. Rovsing: Underlivskirurgien **2** (quoted by Rydgaard).
14. Carlson, A. J.: Physiol. Rev. **3**: 1-40 (Jan.) 1923.

15. Hardt, L. L. J.: Studies of Cause of Pain in Gastric and Duodenal Ulcers; Peristalsis as Direct Cause of Pain in Gastric Ulcers with Achylia and in Duodenal Ulcers, Arch. Int. Med. **29**: 684 (May) 1922.

Mikulicz' Disease.—The condition first reported by Mikulicz in 1888 forms the subject of a recent illustrated book by Dr. Menotti Sainati of São Paulo. The author was granted a prize and gold medal by the local medical society for his thorough pathologic and clinical study. When Mikulicz described his case, there were already on record suggestive cases by Arnold and Becker (1872), Abadie (1880), Delens (1886), Power (1886-1887), and Frost (1886-1887). Neither these cases nor those reported by Gallasch (1874), Leber (1878) and Reymond (1883) were really germane. In the first group, the lacrimal swelling was caused by some specific process, and in the second group there was, in addition to the characteristic enlargement of lacrimal and salivary glands, involvement of lymph nodes and spleen.

RIGHT PARADUODENAL HERNIA*

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Examples are recorded in the literature of passage of the intestines through the foramen of Winslow, through the mesenteries, under the cecum, into the intersigmoid fossa and other peritoneal pockets, notably those about the duodenojejunal flexure. The last named constitute the so-called paraduodenal hernias, of which there are two types: left and right. Approximately 100 cases of left paraduodenal hernias have been recorded, and in a thorough search of the literature I have found twenty-eight of the right. The following case is an example of the latter:

REPORT OF A CASE

The hernia, unsuspected in life, was found at necropsy in a man, aged 55, on whom a diagnosis of general carcinomatosis had been made during an exploratory laparotomy. He had complained for many years of a slight feeling of discomfort in the right lower abdominal region after meals. Two months before his death, he began having dull, aching pains in the chest and epigastrium, with nausea, bloating, constipation and loss of weight. A roentgenogram of the stomach was negative, but the cecum and ascending colon were low in the pelvis, and fixed and rotated to the left, while a few loops of small intestine were grouped to the right of the ascending colon. The condition appeared to represent an incomplete intestinal rotation, and no further significance was attached to it (Fig. 1).

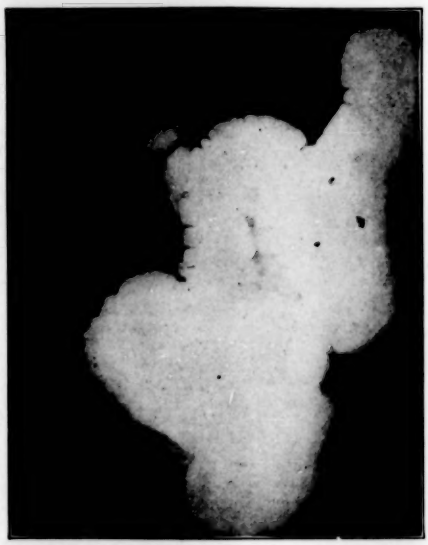

Fig. 1.—Colon filling left half of abdomen, with coils of small intestine grouped to the right.

Necropsy revealed generalized malignant melanoma involving the kidneys, mesentery, intestines and other organs, and general peritonitis. These findings explained the patient's recent symptoms and death, but apparently did not explain the hernia. When the abdomen was first opened, no small intestine was seen, the coils being covered by a long mesentery of the ascending colon. Above, only a small portion of the stomach and the first part of the duodenum were visible. The cecum lay at the pelvic brim near the middle line, and the ascending and transverse colon ran sharply upward on the left side of the abdomen to the normally situated splenic flexure, where it doubled back to form the descending colon (Fig. 2). When the ascending colon and its mesentery were lifted, the coils of small intestine were seen escaping from a retroperitoneal pocket in which nearly the entire bowel had been held captive. This pouch, the neck of which measured 6 cm. in diameter, was situated to the right of the fourth and fifth lumbar vertebrae, and was formed, posteriorly and below, by a thin, nonvascular peritoneal fold which curved laterally and anteriorly on to the root of the mesentery of the small bowel, in which ran the terminal branches of the superior mesenteric artery, and which formed its anterior margin (Fig. 3). The cavity itself was about 12 cm. in depth and extended well out under the mesenteries of the small bowel and ascending colon toward the lateral abdominal wall. In order to replace the coils of intestine into the hernial sac, the upper portion of the mesentery with its attached intestine had to be rolled downward and to the left and under that portion of the root of the mesentery which formed the free anterior margin of the sac. The inferior mesenteric vein and left colic artery were in their normal locations and did not enter into the structure of the hernia. The duodenojejunal flexure was poorly marked and was suspended by a short mesentery, situated just to the right of the middle vertebral line. The visceral and parietal peritoneal surfaces were thickened and opaque, as a result of the general peritonitis, but there were no adhesions or evidences of intestinal obstruction, the small bowel being easily withdrawn and replaced within the hernial sac. The condition was a typical right paraduodenal hernia. The presence of a persistent mesentery to the ascending colon may have aided in forcing the intestines into the pocket, and it undoubtedly helped maintain them there.

COMMENT ON CASES REPORTED FROM THE LITERATURE

According to Moynihan,[4] Cooper's mesenteric hernia is probably the first published example of a right duodenal hernia; but, because of insufficient data, Moynihan did not include it in his list. The hernia reported by Zander[26] also is too briefly described to be added to the well authenticated cases. In Pikin's[23] case, the hernia extends up between the leaves of the mesentery of the small bowel, a condition which is also present in Haasler's second case. Pikin, however, although he classifies his case as a right duodenal hernia, refers to the poorly marked hernial orifice as lying on the right side of the mesentery, and he apparently withdrew the small bowel through an incision, also made in the right leaf of the mesentery. A typical right duodenal hernia enters from the left or under side of the mesentery, and an attempt to withdraw it through the right leaf would result only in a further twisting of the intestine. Willis,[27] in recording his unusual tumor, described what is evidently a retroperitoneal hernia, which from its location may be of the right duodenal type; but he does not recognize it as such, and his description, although detailed, does not permit accurate

* This work was done in the Division of Pathology, Mayo Clinic, under the supervision of Dr. H. E. Robertson.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

classification. One of the hernias in my list of authentic cases may be open to question. I refer to Gruber's complicated case, which, although included by Moynihan, is laboriously but poorly described, and leaves some doubt in the mind of the reader as to its exact nature. The hernia described by MacCallum and Miller [21] differs from the more usual type of right paraduodenal hernia in that it is formed by an outpocketing of both layers of the mesentery, under the superior mesenteric artery. The presence of the latter artery in the anterior margin of the neck of the sac establishes it definitely as a right paraduodenal hernia.

ORIGIN OF RIGHT PARADUODENAL HERNIA

The origin of right paraduodenal hernia has not been definitely established, since it has not been observed in early and progressive stages. Fürst,[5] in 1884, suggested a possible embryonic origin, that is, a late descent of the cecum, with the small bowel impeding its progress and forming a pocket under the mesocolon, in which it remains lodged. Others attribute its formation to a primary failure of the root of the mesentery to unite with the posterior abdominal wall, or to the prevention of such fusion by a loop of small bowel being caught under the mesentery during intestinal rotation. Such theories have little to support them and have never been widely accepted. Nearly all observers agree that the condition represents a true herniation of the intestines into one or the other of the fossae around the duodenojejunal flexure.

Fig. 2.—Mesentery of ascending colon covering the right paraduodenal hernia.

A knowledge of the embryology and anatomy of these fossae is essential to a proper understanding of this type of hernia. The whole subject has been needlessly complicated and confused by the different names attached by various investigators to identical structures, this nomenclature being due no doubt to the wide normal variations in size, shape and minor anatomic details of the peritoneal folds found in this region. Such variations can be understood if the mode of origin of these folds is borne in mind. Treitz [28] believed them to be traction folds produced during intestinal rotation and fixation. Waldeyer thought that they were caused by blood vessels lifting up small areas of peritoneum, and spoke of them as vascular folds. However, as the majority of the folds are not associated with vessels, this explanation does not apply in all instances, although it may explain the formation of the fossa of Landzert, in the anterior margin of which runs the inferior mesenteric vein. The theory advanced by Moynihan [4] and accepted by most modern writers is that they are fusion folds originating in fetal life by the so-called process of physiologic adhesions, first described by Langer and Toldt,[29] in which, during intestinal rotation, portions of the common dorsal mesentery, destined later to become obliterated, first adhere and then fuse with the posterior abdominal wall.

In dissecting a number of fetuses, I was able to observe different stages of intestinal rotation and fixation. The mesenteries, which normally disappear, first fold to the right and left in the ascending and descending colon, respectively, their under surfaces adhering lightly to the underlying parietal peritoneum. In the early stages they can be pulled away by gentle traction, leaving a slightly roughened surface, much as if they had been glued down and then separated before the glue had dried. Later the union becomes complete, all traces of the opposing peritoneal surfaces disappear, and the free side of the mesentery remains as the parietal peritoneum covering that portion of the abdominal cavity. In a similar manner, the duodenum loses its mesentery, and that of the small bowel becomes attached along a line extending diagonally from left to right across the posterior abdominal wall. This movement of intestine, and the gluing process of the mesenteries, results in the raising up of peritoneal folds at certain points, especially around the duodenojejunal angle and the cecum. That such folds vary greatly is readily understood.

Moynihan,[4] who was the first English writer to organize our knowledge on the subject, describes nine fossae around the duodenojejunal flexure. Only those of direct interest will be considered here. The most common folds and their corresponding fossae are the superior and inferior paraduodenal. These folds are composed of thin, nonvascular peritoneal membranes passing laterally from the bowel to the posterior abdominal wall, and may be present singly or together

28. Treitz, W.: Hernia retroperitonealis: Ein Beitrag zur Geschichte innerer Hernien, Prague, Credner, 1857.

29. Toldt, C.: Bau und Wachsthumsveränderungen der Nekröse des menschlichen Darmkanales, Ed. 2, Vienna, Tempsky, 1889.

(Fig. 4). In the latter case, their lateral margins are usually united, forming a semicircular fold, in the margin of which, usually about 5 mm. from its free border, lies the inferior mesenteric vein. It is this laterally placed pouch under the inferior mesenteric vein which constitutes the fossa of Landzert, and into which the left duodenal hernia occurs. It may exist in conjunction with the other fossae as just described (Fig. 4), or alone (Fig. 5). In an examination of eighty-five adult subjects and seventeen fetuses of from 2 to 8 months, I found the fossae present as shown in Table 1. The high percentage of negative findings in the fetuses is due to the fact that the folds had not yet formed in the younger ones.

My findings differ considerably from those of Treitz,[28] Moynihan,[4] Desjardins[30] and others, who found that the inferior fossa was the one most constantly present, namely, in as high as from 60 to 70 per cent. of cases. Treitz and Desjardins each examined 100 subjects, and while none of these series are large enough to furnish accurate statistical data, they serve again to emphasize the variations to which these folds and fossae are subject. In none of my cases, with the possible exception of the one described, did I find the type of fossa said by Moynihan[4] and others to be the only source of origin of right paraduodenal hernia, namely, the mesentericoparietal, or fossa of Waldeyer. Moynihan[4] describes it as lying in the first part of the mesojejunum, bounded in front by the superior mesenteric artery and behind by the lumbar vertebrae, its orifice pointing to the left, and its blind extremity to the right. The characteristics of a hernia into this fossa are its situation, at least in the early stages, on the right side of the body, and the presence of the superior mesenteric artery, or the root of the mesentery, in its anterior margin. Moynihan[4] was able to find the fossa three times in his series of adults, and six times in seventeen embryos. In four of my subjects, the inferior duodenal fossa was situated very low, near the beginning of the third portion of the duodenum and over the center of the vertebral column, or even to the right of the middle line, the peritoneal fold passing over the duodenum and losing itself on the mesentery of the small bowel (Fig. 6). In one of these cases, there was an associated persistent mesentery to the ascending and descending colon. Herniation into such a fossa would naturally progress toward the right, and by a peeling back of its superior peritoneal margin until it reached the mesenteric vessels, would form a typical right paraduodenal hernia.

Klob,[1] who first described this form of hernia accurately, ascribed its origin to the inferior duodenal fossa, and Jonnesco[31] later concurred in this view. Gruber[2] reported a case associated with a persistent mesentery for the large bowel. He attached considerable significance to this finding, associating it with a fossa situated to the right of the middle line. Moynihan[4] and Broesike[9] do not believe that a right duodenal hernia can arise in the inferior duodenal fossa, and the former asserts, further, that there is no recognized variation in the situation of either the superior or inferior duodenal pouches. My findings and those of others, however, do not support this view. Moynihan[4] quotes a case of Molins' of herniation into the inferior duodenal fossa, which differs from the usual right type of hernia in two essentials: (1) The anterior boundary of the neck of the sac does not contain the superior mesenteric artery, and (2) its orifice is well to the left of the root of the mesentery. In this instance, the inferior fossa was undoubtedly in its more usual position, high and to the left of the middle line (Fig. 4), in which case a right duodenal hernia would not be likely to occur. Two cases reported by Meyer[32] and one by Wallace and Allen[33] are probably also of this type.

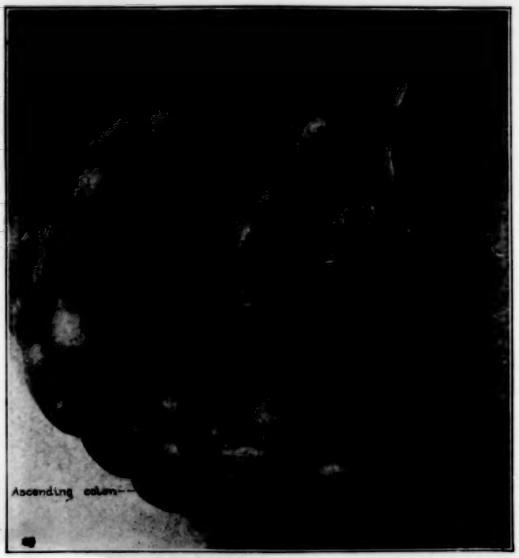

Fig. 3.—Orifice of right paraduodenal hernia, with greater part of small intestine withdrawn from the sac.

Unusual situations of these fossae, however, have been observed, and occasionally one may well give rise to a right paraduodenal hernia. The fossa shown in Figure 6 is undoubtedly the one referred to by Haasler[29] as being a possible source of origin of right paraduodenal hernia.

Additional types of paraduodenal hernias to those described above have been recorded. Any of the fossae

30. Desjardins, A. U.: Left Paraduodenal Hernia: Description of One Case, Ann. Surg. 67: 195-201 (Feb.) 1918.

31. Jonnesco, T.: Hernies internes rétro-péritonéales, Paris, Steinheil, 1890.

32. Meyer, W.: Ueber zwei Fälle von Darmeinklemmung in noch nicht beschriebenen Bauchfelltaschen, Deutsch. Ztschr. f. Chir. 53: 547-556, 1899.

33. Wallace, W. L., and Allen, J. S.: Intraperitoneal Hernia: A Case, Buffalo M. J. 66: 300-303, 1911.

about the duodenojejunal flexure may, under favorable conditions, give rise to hernias. It is not essential that a vessel of any appreciable size be found in the neck of the sac. Kohlmann [34] describes a hernia in the posterior duodenal fossa. This is a pocket lying directly behind the fourth portion of the duodenum, its blind end directed downward and to the right, in the direction

Fig. 4.—The superior and inferior duodenal folds, and the fossa of Landzert.

of the long axis of this portion of the intestine and its orifice facing upward and to the left. Cunha Lamas [35] reports a case of herniation into the superior duodenal fossa. Morton [36] describes a right sided, retroperitoneal hernia in an infant, associated with a congenital atresia of the duodenum. The orifice of the sac was formed by a nonvascular peritoneal band attached to the second portion of the duodenum and lying to the right of the mesentery of the small bowel. The foregoing cases must be separately classified as rarer forms of paraduodenal hernias.

A poorly marked duodenojejunal flexure was found by Haasler [20] in both his cases, a condition which was

TABLE 1.—*Distribution of Fossae in Eighty-Five Adult Subjects and Seventeen Fetuses*

	Adults		Fetuses	
	Number	Per Cent.	Number	Per Cent.
Superior and inferior duodenal fossae	51	60.0	5	29.4
Superior duodenal fossa	20	23.5	1	5.8
Inferior duodenal fossa	3	3.5	1	5.8
Fossa of Landzert alone or combined with superior fold	4	4.7	4	23.5
No fossae	6	7.1	6	35.2
Unclassified	1	....	..	....
Total	85	....	17	....

also present in my case. In Clarke's [10] subject the entire third portion of the duodenum was to the right of the superior mesenteric vessels and possessed a short mesentery. A fossa of Waldeyer, capable of giving rise to a right paraduodenal hernia, may be present when all other anatomic relations are normal. The fairly frequent association, however, of a persistent

34. Kohlmann, J.: Ueber Retroperitonealhernien: Ein Fall von Hernia retroperitonealis totalis accreta, Leipzig, F. Peter Nachf, 1913.
35. Cunha Lamas, A.: Sobre hernias para-duodenaes, Med. contemp., Lisbon **31**: 403-407, 1913.
36. Morton, J. J.: Atresia of the Duodenum and Right Internal Hernia, Am. J. Dis. Child. **25**: 371-378 (May) 1923.

TABLE 2.—*Recorded Cases of Right Paraduodenal Hernias*

No.	Observer	Year	Age	Sex*	When Diagnosed	Symptoms of Acute Obstruction	Operation	Result
	Authentic Cases							
1.	Klob	1861	36	♂	At necropsy	....	No	
2.	Gruber	1868	25	♂	At necropsy	....	No	
3.	Moutard-Martin	1870	..	..	Dissecting room	....	No	
4.	Guy's museum Specimen 1084	1870-1871	..	..	Museum specimen	No	No	
5.	Fürst	1884	61	♂	At necropsy	....	No	
6.	Zwaardemaker	1884	Adult	♂	At necropsy	Yes	No	
7.	Quénu (Jonnesco)	1885	50	♂	At operation	Yes	Yes	Death
8.	Gerard-Marchant	1885	..	..	Dissecting room	....	No	
9.	Broesike	1884-1885	2	♂	Dissecting room	....	No	
10.	Broesike	1886	Adult	♂	Dissecting room	....	No	
11.	Barrs	1891	18	♂	At necropsy	Yes	No	
12.	Clarke	1895	Adult	♂	At operation	Yes	Yes	Death
13.	Rose	1895	68	♀	At operation	Yes	Yes	Death
14.	Morestin	1896	Advanced age	♂	Dissecting room	Yes	No	
15.	Neumann	1898	35	♀	At operation	Yes	Yes	Cure
16.	Griffith (Moynihan)	1898	..	..	Museum specimen, Leeds Infirmary	....	No	
17.	Küppers	1899	..	..	.....	....	....	
18.	Schwalbe	1902	14 mo.	♂	Dissecting room	....	No	
19.	Schwalbe	1903	Adult	♂	Dissecting room	....	No	
20.	Selby	1904	40	♂	At operation	Yes	Yes	Death
21.	Paton	1906	3 mo.	..	At operation	Yes	Yes	Death
22.	Haasler	1907	43	♀	At necropsy	....	Yes	Death
23.	Haasler	1907	10	♂	At operation	Yes	Yes	Death
24.	MacCallum and Miller	1908	41	♂	At operation	Yes	Yes	Death
25.	Van Rossum	1909	..	..	.....	....	....	
26.	Merrigan	1911	..	..	Dissecting room	....	No	
27.	Mueller	1911	47	♂	At operation	Yes	Yes	Death
28.	Carson	1912	29	♂	At operation	Yes	Yes	Cure
29.	Nagel	1923	55	♂	At necropsy	No	Yes	Death
	Unauthentic Cases							
1.	Cooper	....	..	..	.....	....	....	
2.	Pikin	1912	27	♀	At operation	Yes	Yes	Cure
3.	Zander	1917	..	..	Not stated	....	....	
4.	Willis	1922	11	♂	At operation	Yes	Yes	Not stated

* In this column, ♀ indicates female; ♂, male.

Fig. 5.—The fossa of Landzert (Desjardins).

mesentery to the ascending colon in examples of this type of hernia may be of some significance. Abnormal or unusual fossae are more apt to be present when intestinal rotation is not complete, and, besides, the presence of the entire large bowel on the left side of the abdomen, by crowding the small intestine to the

right, may well be a factor in the production of this type of hernia. Broesike [8] emphasized a fusion of the first part of the jejunum with the posterior abdominal wall, which he found in both his subjects, and believed to be essential for the formation of this type of hernia. In these cases only the efferent loop of intestine may be seen to pass through the hernial orifice, the afferent loop entering retroperitoneally from above.

This condition has also been observed by others (Schwalbe [16]), but the jejunum has been found free in a number of instances (Neumann,[13] Merrigan,[22] Clarke,[10] Nagel and others). Moynihan [4] makes this the basis for a division of right hernia into two types, calling those in which the jejunum is adherent "hernia mesenterico-parietalis parajejunalis," and those in which it is free "hernia mesenterico-parietalis paraduodenalis." Such titles are anatomically accurate, though cumbersome.

Whether the hernia in my case arose in a typical fossa of Waldeyer, or in the type of inferior duodenal fossa I have described, I am unable to determine. Unfortunately, the duodenal folds were not observed, but either origin would explain the condition as found, the low position of the orifice being due to migration of its peritoneal margins. While the majority of right duodenal hernias probably arise in the fossa of Waldeyer, it is reasonable to assume that some of them may originate in the type of inferior duodenal fossa shown in Figure 6. It is axiomatic that the pocket must be large enough to admit an entering wedge of intestine, and its margins sufficiently resistant to allow an undermining of the peritoneum, and prevent a simple flattening out of the fold that would otherwise result.

Fig. 6.—Inferior duodenal fossa situated unusually low, and to the right of the middle line.

SYMPTOMS AND DIAGNOSIS

In a discussion of the symptoms and clinical diagnosis of paraduodenal hernia, no sharp dividing line can be drawn between the right and left types. Table 2 is a summary of twenty-nine cases, including my own, of right paraduodenal hernia which I have been able to find in the literature. A correct clinical diagnosis was not made in a single instance. In seventeen, the condition was found at examination after death. Thirteen patients had definite symptoms of acute intestinal obstruction, six with histories of previous similar attacks. Twelve patients were operated on, and in ten of these, the symptoms were found to be due to the hernia. Of ninety-one cases of left duodenal hernia collected by Pikin,[25] only three were clinically diagnosed. The majority of patients did not have symptoms, the condition being found accidentally at necropsy, while a few showed signs of either acute or chronic intestinal obstruction, with occasionally a visible or palpable, well defined, globular, abdominal mass. A roentgenologic examination has been made in a few instances of left duodenal hernia (Scheele,[37] Wagner,[38] Kummer [39] and others), and in my case of the right duodenal type. The diagnosis may be suggested by finding a dilated duodenum, due to a constriction of the first part of the jejunum by the neck of the sac; and the small intestines may appear to be compressed into an ovoid mass, which remains supported in the abdomen instead of gravitating downward when the patient assumes the erect position.

TREATMENT

In the presence of symptoms, the treatment of these hernias is surgical. It is important to recognize the exact type of hernia present. As already noted, if it is left paraduodenal, its orifice opens to the right with the inferior mesenteric vein or left colic artery traversing its anterior margin; if right, the opening is posterior and to the left, and the superior mesenteric vessels lie in its anterior superior border. Small hernias may lie either in the left or right half of the abdomen, but when large, they occupy the greater part of the abdominal cavity. In most instances, particularly in the left type, reduction and obliteration of the sacs are accomplished without great difficulty. The sac should be closed if conditions will permit. In the cases in which Paton [19] and Mueller [23] operated and in which this procedure was not carried out, necropsy revealed that a considerable portion of the intestines had reentered the sacs. Combining the summaries of Short [40] and Philips,[41] it is found that of twenty-eight patients with left paraduodenal hernia, seventeen were operated on, with thirteen cures and three deaths; in one patient the operation was abandoned. Of the twelve patients operated on for right duodenal hernia in the series here reported, only two were cured, while ten died. Usually the bowel was easily withdrawn, although occasionally slight adhesions were encountered, especially near the orifice of the sac. Neumann [13] closed the neck of the

37. Scheele, E.: Beitrag zur Diagnostik der Hernia duodeno-jejunalis, Centralbl. f. Chir. **48**: 188-190, 1921.
38. Wagner, A.: Zur Pathologie, Klinik und Chirurgie der Duodenojejunalhernien, Deutsch. Ztschr. f. Chir. **135**: 497, 1916.
39. Kummer, E.: Signes radiologiques de la hernie interne duodenojejunale, J. de radiol. et d'électrol. **5**: 362-364 (Aug.) 1921.
40. Short, A. R.: A Case of Retroperitoneal Hernia Cured by Operation, with a Report on the Literature of the Subject, Brit. J. Surg. **3**: 48-54, 1916.
41. Philips, R. S.: Paraduodenal Hernia: Description of a Case and Summary of the Literature to Date, Bull. Ayer Clin. Lab. Pennsylvania Hosp. **30**, May, 1922.

sac, leaving only a small opening below for purposes of drainage. In Haasler's [29] second case, in which the bowel had ruptured through a rent in the mesentery and become strangulated, the mesenteric rent was closed, but the orifice of the sac was not interfered with. Occasionally, the bowel becomes incarcerated, and then an incision must be made in the wall of the sac, care being taken to avoid the inferior mesenteric vein or superior mesenteric vessels, as the case may be. By relieving pressure, this allows the intestine to be withdrawn through the hernial orifice, after which the latter can be closed. Gangrenous bowel and other complications must, of course, be dealt with according to recognized surgical procedures. The obliteration of the sac in right duodenal hernia might present greater difficulties than in the left, especially in a case such as Case 29, Table 2, in which the superior margin was formed by the root of the mesentery, and in which only the posterior inferior margin could be cut away. This, however, should be sufficient to destroy its character as a hernial pouch.

Although all internal abdominal hernias are rare, particularly the right paraduodenal type, they are of practical as well as academic interest. In patients with obscure gastric and intestinal complaints, and particularly in those with acute or recurring symptoms of intestinal obstruction, the possibility of their presence must be borne in mind. At operation, the type of hernia should be recognized promptly and appropriate surgical procedures carried out.

SUMMARY

Right paraduodenal hernia constitutes a rare form of internal abdominal hernia. Twenty-eight authentic cases have been previously reported, to which number I add one. This form of hernia may arise in the fossa of Waldeyer, or in the type of inferior duodenal fossa I have described. Clinically, no sharp dividing line can be drawn between hernias of the left and right types. I have not been able to find a reported case in which right duodenal hernia has been correctly diagnosed clinically. If patients have obscure intestinal complaints, and particularly if they have symptoms of acute obstruction, the possibility of the presence of internal hernia must be borne in mind. At operation it is important to recognize the type of hernia, so that reduction may be effected with dispatch, and without injury to vital structures.

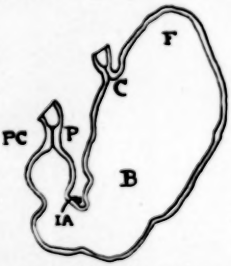

Fig. 1.—Schematic outline of the stomach: *C*, cardia; *F*, fundus; *I A*, incisura angularis; *B*, body; *P C*, pyloric canal; *P*, pylorus. The antrum is the portion from *I A* to *P C*, inclusive. (From Cannon.) The pyloric canal is very muscular and about 3 cm. in length. To secure physiologic rest in this region, the pyloric canal should be divided.

Effect of Tropical Climate on Efficiency.—Tropical climate plays a primary part by undermining or lowering the bodily resistance; secondly, mental factors, such as conflicts come in during this debilitated state and determine the nature of the psychoneurotic symptoms. Imperfection of organic functions tends to produce an undue prominence in consciousness of the bodily self and, therefore, an introspective and brooding habit of mind. It is during this stage that problems seem hard to face, decisions cannot be made, and sleepless nights or nightmares develop. In the worst cases, the family history and early life clearly indicate a psychopathic tendency and it is suggested that in selecting individuals for service in the tropics we should take this into consideration.—T. S. Rippon: *Proc. Roy. Soc. Med.* **16**:53 (Aug.) 1923.

THE CHOICE OF OPERATIONS FOR GASTRIC AND DUODENAL ULCERS

WITH ESPECIAL REFERENCE TO PYLOROPLASTY *

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An appreciation of the proper therapy for ulcer of the stomach and duodenum depends on a knowledge of the pathologic conditions present, and an acquaintance with the physiology of these viscera. It is of prime importance in surgical operations to remove or to correct the pathologic conditions, but it is also essential to restore physiologic function. Much of the physiology of the stomach remains undetermined. As Alvarez says, in observing the function of the stomach, we see more than we can understand. However, there are many established facts, especially from recent research work, which are very helpful in comprehending the pathogenesis of gastric and duodenal ulcers, and in adopting the proper treatment for these lesions. Consequently, I will review briefly the relevant physiology, concerning (1) the motility of the stomach, and (2) its secretion.

PHYSIOLOGY

The stomach is divided by the insisura angularis into two main portions, the pyloric and the cardiac (Fig. 1). The cardiac portion consists of the body of the stomach, and the cardiac pouch, or fundus, lying above the level of the esophageal opening. In roentgenograms, this pouch usually contains gas. The pyloric portion of the stomach has a greater muscular supply than the cardiac portion, and the muscular coat increases in strength toward the pyloric sphincter. The antrum of the pyloric part of the stomach extends from the incisura to the pyloric canal. The pyloric canal is about 1¼ inches (3 cm.) long, and terminates in the pyloric sphincter. It is more marked in children, and has a thick, powerful, circular muscular coat. It is here that congenital pyloric stenosis occurs in infants. The contractions of this canal are very vigorous, and in a pyloroplasty it should be divided in order to obtain physiologic rest during healing of the wound. The contractions of the pyloric canal necessarily affect the adjoining portion of the duodenum.

A short time after the ingestion of food, peristalsis begins about the center of the body of the stomach and extends toward the pyloric canal. According to Cole, each peristalic wave lasts about two seconds, and consists of a systole, or period of contraction, taking seven tenths of the time, and a diastole, or a period of relaxation, during three tenths of the two seconds.

Recent observations by Luckhardt, Phillips and Carlson, and by Wheelon and Thomas [1] seem to show that the pyloric sphincter relaxes as each strong peristaltic wave reaches it, and not on account of acid or

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

1. Macleod, J. J. R.: Physiology and Biochemistry, Ed. 4, St. Louis, C. V. Mosby Company, pp. 491-494.

chemical control. The left part of the body of the stomach and the cardiac pouch have no peristaltic waves, but remain tense like a rubber bag, acting as a hopper to push the food, when it is needed, into the pyloric portion.

The chief digestive elements in the gastric juice, hydrochloric acid and pepsin, are secreted mainly in the body of the stomach. Carlson [2] has shown that there is to some extent a continuous secretion of gastric juice. He says that there is no such thing as hyperacidity, because normal gastric juice may contain 0.5 per cent. of hydrochloric acid, and the pathologic variation is toward hypo-acidity. According to his observation, even "appetite" gastric juice is not essential to good digestion, and perfect health may be maintained with gastric juice of very low acidity. The pyloric portion of the stomach produces neither acid nor pepsin. The pyloric secretion is alkaline.

When the stomach is full, it is pyriform. As it empties, it becomes tubular. This change in shape is not produced by symmetrical contraction toward the central axis of the stomach, but by the greater curvature moving toward the lesser curvature, which remains comparatively fixed (Fig. 2). The axis of the peristaltic waves tends to be along the lesser curvature. Gravity plays practically no part in emptying the stomach, so it is important in midgastric or "sleeve" resections to have the lesser curvature in a straight axis, no matter how many pouches or irregularities of contour are along the greater curvature. In the Polya resection also, as has been pointed out by C. H. Mayo, the exit for food should be along the lesser curvature.

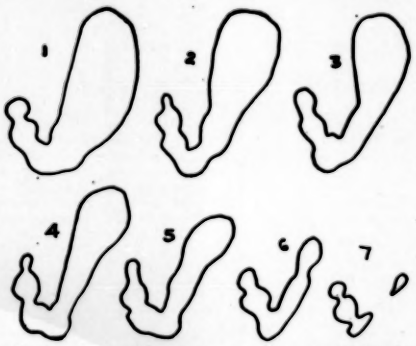

Fig. 2.—Outline of the roentgen-ray shadows cast by the stomach of a cat at hourly intervals after ingestion of food containing bismuth. (From Cannon.) The appearance is quite similar to the stomach of man. There is change from a pyriform shape to a tubular outline, with the lesser curvature remaining almost stationary and the greater curvature approaching the lesser curvature; hence the importance of proper alinement of the stomach along the lesser curvature after a resection.

ETIOLOGY

Mann and Williamson [3] have recently done some excellent work on the experimental production of peptic ulcers. Their summary is as follows:

> Experiments were devised for diverting the secretions which neutralize the gastric juice, as it leaves the stomach, to another portion of the intestine removed from the point of emergence of the acid. Under such conditions, typical subacute or chronic peptic ulcer, quite comparable pathologically to that found in man, developed in the intestinal mucosa, just adjacent to the gastric mucosa, in a high percentage of cases.

Among the experiments made by Mann and Williamson was a series in which the duodenum was severed from the stomach, and the end of the duodenum was closed. The jejunum was severed lower down, and the distal end of the jejunum was sutured to the pyloric end of the stomach, and the upper end of the severed jejunum was sutured end-to-side to the ileum. These operations were done with great care, no clamps were placed near the sutures, the bleeding was controlled, and 00 chromic catgut was used for sutures. In sixteen animals in which this experiment was performed and which came to necropsy, fourteen had ulcers of the subacute or chronic type, similar to peptic ulcers in man. These ulcers were usually in the intestine a short distance from the point of union of the intestine with the stomach.

Rosenow's [4] work on the affinity of certain strains of streptococci for the mucosa of the stomach and duodenum is well known, and emphasizes the important rôle of focal infection. This, however, is doubtless not the sole cause for peptic ulcers, and even these bacteria would probably locate at some point in this region where a small thrombus or lesion existed. Reeves [5] has shown that the blood vessels in the pyloric portion of the stomach and the first part of the duodenum take a very oblique course in the gastric and duodenal walls, which apparently renders them particularly susceptible to thrombosis. Lesions of the nervous supply of the stomach may produce ulcer, as shown by Durante; but this may be caused by the effect on the vascular circulation. We have seen, too, that the most vigorous peristaltic motion is in the pyloric portion of the stomach, and that this region has a normal alkaline secretion.

It seems probable that the hydrochloric acid of the gastric juice may not only act on a local lesion in a portion of the mucosa whose vitality has been impaired by a septic thrombus or injured by vigorous peristaltic action, but, as in jejunal ulcers, may actually initiate the lesion.

TREATMENT

Medical treatment should go hand in hand with the surgical treatment in operations for gastric or duodenal ulcer. Certain foods, as meats, carry a marked stimulus not only for gastric juice, but also for peristalsis. As gastric digestion chiefly is concerned with animal proteins, to rest the stomach this kind of food should be limited or omitted. If the diet can be so arranged as to reduce the work of the stomach to a minimum, and at the same time provide sufficient nutrition for the patient, we shall be taking advantage of the physiologic rest, and in this way healing will be promoted after operation, or in early superficial ulcers in which operation does not appear to be indicated. The physiology of the stomach is necessarily altered to some extent by any surgical operation, and the operation should be made to fit the pathologic condition. Consequently, when the pathologic changes in the stomach are extensive, and the operation is therefore mutilating, even more care should be paid to the diet than when a slighter operation is done.

2. Carlson, A. J.: The Secretion of Gastric Juice, Physiol. Rev. 3: 1-41 (Jan.) 1923.
3. Mann and Williamson: Experimental Production of Peptic Ulcer, Ann. Surg. 77: 409-422 (April) 1923.
4. Rosenow, E. C.: The Causation of Gastric and Duodenal Ulcer by Streptococci, J. Infect. Dis. 19: 333 (Sept.) 1916.
5. Reeves, T. B.: Surg., Gynec. & Obst. 33: 374 (April) 1920.

The cause of pain in ulceration of the stomach and duodenum is from hypersensitiveness of the sensory nerves that lie deep in the stomach wall, and this hypersensitiveness, probably due to hyperemia on account of the ulcer, causes these nerves to register pain and discomfort, particularly when excessive peristalsis is present. A diet that tends to lessen the work of the stomach not only promotes rest and healing, but also relieves pain.

Fig. 3.—Billroth I operation, modified by alinement of the structures along the lesser curvature, instead of along the greater curvature as in the original Billroth operation. The lower border is easily tucked in and can be sutured safely. The internal row of sutures is a continuous locksitch, and no effort is made to invert the tissues. This controls bleeding. The outer row of sutures infolds the slightly exposed mucosa.

The method by which soda or alkalis relieve the pain from gastric or duodenal ulcers has not been fully determined (Carlson). Reducing the acidity of the gastric juice may tend to lessen peristalsis, though a few ulcers are accompanied by a low acidity of the gastric juice. Then, too, some observers [6] find pain without marked peristalsis. Possibly the alkalis act reflexly and thus cause a temporarily decreased hyperemia, so reducing the sensitiveness of the nerves. These things, however, have not been determined.

As foci of infection may harbor streptococci with affinity for the mucosa of the stomach and duodenum, these foci should be removed. They commonly exist in diseased teeth, tonsils, appendix or gallbladder.

There are many operations that may be indicated in ulcers of the stomach or duodenum. Any surgeon who follows blindly one type of procedure will get unfortunate results in many cases, no matter how cleverly he may perform the operation. When we consider that ulcers of the stomach or duodenum vary from a superficial erosion that may be cured with medical treatment to a large saddle ulcer or complete stenosis, we can readily appreciate the folly of making any one operation fit all of these different conditions. We must first bear in mind a principle applicable in all types of surgery, and that is to remove or correct the pathologic condition, and at the same time restore the physiologic condition of the tissue involved. This principle is nowhere more needed than in the surgery of the stomach or duodenum. With a small, callous ulcer in the duodenum or stomach without extensive inflammatory exudate, we have an opportunity to remove the pathologic condition and at the same time to restore physiologic condition to practically normal. When there is marked stenosis of the pylorus, extensive adhesions, or a large infiltrating ulcer of the duodenum, restoration is impossible, as the tissues are permanently and extensively damaged, and gastro-enterostomy should be done.

As I [7] have previously pointed out, with pyloric stenosis the alkalinity of the duodenal contents is retained at its maximum, and seems to protect the mucosa of the jejunum from the acid of the stomach at the stoma of the gastro-enterostomy. When the pylorus is open and unobstructed, however, the acid gastric juice passing through it lowers this alkalinity and takes away the protection of a highly alkaline content.[8] It is in such cases that every operator will find sooner or later considerable trouble after a gastro-enterostomy; either this is in the congestion and irritation of the mucosa of the jejunum at the stoma of the gastro-enterostomy, or else this precedes an actual jejunal ulcer. Jejunal ulcer is exceedingly rare except after gastro-enterostomy with an open pylorus, and the treatment for this ulcer is to uncouple the gastro-enterostomy and to do a pyloroplasty. Would it not seem much more logical in patients with an open pylorus to do a pyloroplasty with excision of the ulcer in the first instance?

Macleod [9] says:

An important surgical application of these facts about gastric peristalsis concerns the behavior of food after gastro-enterostomy. It has been thought that this operation would cause the food to be drained from the stomach into the intestine and thus leave the region of the stomach between the fistula and the pylorus inactive. This assumption is based on the idea, which we have seen to be erroneous, that gravity assists in the emptying of the stomach. As a matter of fact, it has been found that, if the gastro-enterostomy is made when there is no obstruction at the pylorus, the chyme takes its

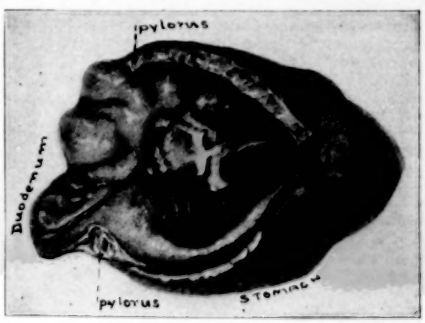

Fig. 4.—Drawing of a pylorectomy in Mr. G., aged 70, done after method shown in Figure 3. He gave a definite history of "stomach trouble" for forty years. The ulcer was cancerous, and there was a small lymph node with metastasis along the greater border. It seems probable that this was a cancerous change in a previously benign ulcer. The margins are corrugated and the ulcer appears rather superficial, compared with the benign ulcer in Figure 7.

6. Reynolds, L., and McClure, C. W.: Motor Phenomena Occurring in Normal Stomach in the Presence of Peptic Ulcer and Its Pain, as observed Fluoroscopically, Arch. Int. Med. **29**:1 (Jan.) 1922.

7. Horsley, J. S.: Clinics and Collected Papers of St. Elizabeth's Hospital, pp. 172-179; Some Underlying Principles of Gastric and Intestinal Surgery, Ann. Surg. **73**:199-210 (Feb.) 1921.

8. Horsley, J. S.: Operative Surgery, St. Louis, C. V. Mosby Company, 1921, pp. 564-565.

9. Macleod: Physiology and Biochemistry, Ed. 4, pp. 494-495.

normal passage through the sphincter and, almost without exception, none leaves by the fistula. When the pylorus is partly occluded, the food sometimes passes in the usual way, and sometimes by the fistula. The cause for this predilection for the pyloric pathway depends on the pressure conditions in the gastric contents. Gastro-enterostomy, therefore, is efficient only when gross mechanical obstruction exists at the pylorus. The operation should never be performed in the absence of demonstrable organic pyloric disease. Another objection to gastro-enterostomy in the presence of a patulous pyloric sphincter rests on the fact that the food, after passing the sphincter and moving along the intestine, may again enter the stomach through the fistula.

Davis[10] says: "Gastrojejunal ulcers are secondary to gastro-enterostomies in approximately 8 per cent. of all such operations." The exact number of patients with jejunal ulcers following gastro-enterostomy with an open pylorus is difficult to ascertain. As has already been explained, when there is a stenosis of the pylorus and consequently high alkalinity of the duodenal contents, the jejunum is protected by this alkalinity from the acid of the gastric juice. So far as I am aware, there has been no effort to sort out the cases in which jejunal ulcer occurs after gastro-enterostomy with an open pylorus, from those after gastro-enterostomy with an actual or a potential stenosis. It is universally acknowledged that in pyloric stenosis a properly performed gastro-enterostomy gives satisfactory results and rarely, if ever, is followed by trouble. If, then, we assume that there are several cases of congestion and irritation of the mucosa of the jejunum for every ulcer—and it seems that this assumption is not violent—the percentage of unsatisfactory results that follow gastro-enterostomy with an open pylorus would mount high.

In view of all these facts, and particularly in the light of the work of Mann and Williamson already mentioned, it is evident that the practice of performing gastro-enterostomy with an open pylorus is very likely to be followed by unsatisfactory results. It is also obvious that all operations are undesirable which are designed in such a manner as to prevent the protection afforded by the alkaline contents of the duodenum to the jejunal mucosa apposed to the stomach. This includes the Roux gastro-enterostomy, in which the jejunum is divided and the oral end implanted lower down end-to-side on the jejunum, and the distal end is attached to the stomach. Here, of course, the end of the jejunum implanted on the stomach is unprotected by the alkalinity of the duodenal contents. Operations, such as have been proposed by Moynihan and others, in which the distal end of the divided jejunum is attached to the stump of the stomach after pyloric resection and the oral end implanted on the jejunum lower down, would seem also to be unphysiologic and in all probability will be followed by ulcers in the jejunum. Methods in which there is a loop of intestine in making a gastro-enterostomy and in which, to prevent a vicious circle, an anastomosis is made between the afferent and efferent limbs of the intestine, deprive the jejunal mucosa that is attached to the stomach of the protection afforded by the alkaline contents of the duodenum. In the Polya operation, in which a loop of jejunum is sutured to the stump of the stomach after resection of the pylorus, it seems better practice to appose the jejunum in such a manner that the proximal or oral end of the jejunal loop will be at the lesser curvature, and will have a free opening with the stomach at this point, the distal portion of the loop being at the greater curvature. Not only is the opening in the axis of the gastric peristalsis at the lesser curvature, but the alkaline duodenal contents are delivered at the top of the wound and in the direction of the peristaltic waves of the jejunum. For these reasons it is much more probable that in this position the duodenal contents will satisfactorily cover the exposed jejunal mucosa, than if the oral end of the jejunum were applied to the greater curvature.

When the ulcer is on the pyloric end of the stomach, and particularly if it is large, a pylorectomy should be done. This may be accomplished by the Billroth I method, in which the stomach is united to the stump of the duodenum, or by the Polya-Balfour operation. The Billroth I method has a certain limited field, when the structures can be united without tension after a portion of the pyloric end of the stomach sufficient to include all of the diseased area has been removed.

Fig. 5.—Tissue from the margin of the cancerous ulcer shown in Figure 4. In the lower right-hand portion, the pyloric glands appear normal. In the center and to the left there is definite histologic appearance of cancer. In the upper right hand portion is leukocytic infiltration. The cancer is apparently of slow growth. Slightly reduced from a photomicrograph enlarged 150 diameters.

Here, however, the union of the duodenum to the stomach should be in line with the lesser curvature, and not with the greater curvature. In this way we keep the axis of the peristalsis straight (Figs. 3, 4 and 5).

In the Polya operation, the anterior method of Balfour is usually most acceptable. This operation seems to have displaced almost entirely the Billroth II operation for pylorectomy, in which a posterior gastro-enterostomy is made after resection of the pyloric portion of the stomach and closure of the stumps. The advantages of the Polya method are obvious. When an ulcer is in the body of the stomach, and is not very extensive, it can sometimes be removed by a local excision. Here no more tissue should be taken than is necessary, and the wound is sutured in three layers with tanned or chromic catgut. The mucosa is first united, then the muscular and peritoneal coats are approximated without attempting to invert them, a third row of sutures which inverts the second row is

10. Davis, D. L.: Gastro-Jejunal Ulcers, Internat. Abst. Surg. (Sept.) 1921, pp. 177-180.

placed, and, finally, the gastrohepatic omentum is sewed over the wound for further safety. If the ulcer requires more than a small excision, a "sleeve" or mid-gastric resection should be done. This operation gives very gratifying results, and should be employed in all of the larger ulcers along the lesser curvature and on the posterior wall of the stomach (Figs. 6, 7, 8 and 9). An extensive V-shaped incision seems to interfere with the harmony of the peristalsis, as it interrupts peristalsis along the lesser curvature but not along the greater curvature. In certain instances, as when the ulcer is inaccessible, the cautery method of Balfour is an excellent procedure. After a V-shaped or local excision of an ulcer, a pyloroplasty should be done in order to lessen the physiologic resistance of the outer end of the stomach and so give comparative rest by removing the necessity for strong peristaltic waves to overcome the pyloric sphincter and canal. This is the same principle as divulsion or division of the sphincter ani in operations on the rectum. A pyloroplasty seems unnecessary after a "sleeve" resection, for all peristaltic waves have been reduced, from the nature of the operation.

If a duodenal ulcer is more than an inch from the pylorus and is not extensive or adherent, it may be excised by a diamond-shaped incision, and the wound sutured transversely, as practiced by E. S. Judd.

Four years ago I [11] described a pyloroplasty that was based on an effort to remove the pathologic conditions and to restore the physiologic function of the stomach as nearly as possible (Figs. 10 and 11).

The indication for this pyloroplasty seems definite. In small or medium sized ulcers of the pylorus or first inch of the duodenum, when there is no marked inflammatory exudate or no adhesions except to the gallbladder, after local excision of an ulcer in the body

Fig. 6.—Specimen from "sleeve" resection of the stomach of Mr. M., aged 48. The roentgen-ray examination showed a defect in the body of the stomach which was thought to be ulcer, but cancer could not be excluded.

of the stomach, and in a narrow pyloric stenosis, this pyloroplasty gives excellent results. If the gallbladder alone is involved in the adhesions, it should be removed at the time of the pyloroplasty and no drainage used. Adhesions are the bane of pyloroplasty, and if extensive and beyond the gallbladder, a pyloroplasty should not be done.

When there is a large infiltrating ulcer in the duodenum or in the presence of extensive adhesions, a gastro-enterostomy gives good results. When the gastro-

Fig. 7.—Internal view of the specimen shown in Figure 6. The ulcer was along the lesser curvature, chiefly in the posterior gastric wall. It is "punched out" in appearance, and measures 1¼ inches in diameter. It is usually supposed that an ulcer of the stomach an inch or more in diameter is malignant. This was benign.

enterostomy is done, a stout kangaroo tendon is placed as a ligature around the pyloric end of the stomach and tied just tight enough to produce occlusion. The pylorus is probably not permanently occluded by this procedure, but it gives at least temporary physiologic rest to the upper duodenum, and should promote healing of the ulcer.

In the first description of this pyloroplasty,[11] eleven cases were reported, with two deaths following operation. The twelfth operation resulted fatally from uremia. None of these deaths can be justly attributed to the technic of the pyloroplasty, for after all three fatalities necropsies were done, but to faulty surgical judgment in operating on a nephritic patient who died of uremia, and to improper technic in excising a gastric ulcer in the body of the stomach in one case, and in cutting a stenosis too deeply in the other. These deaths have been discussed fully elsewhere.[12] I do not believe they would occur now.

To the present time I have done fifty-six of these pyloroplasties, and there have been no further operative deaths. The first pyloroplasty in this series was done, April 31, 1918, and the last, April 17, 1923. The list includes all that I have done. Patients that are complaint free for three or four months after operation usually continue without gastric symptoms, whereas many patients that have gastric symptoms during the first few months after pyloroplasty later become complaint free. In gastro-enterostomy with an open pylorus, this course is often reversed. In the last forty-four cases, the patients have made a satisfactory

11. Horsley, J. S.: New Operation for Duodenal and Gastric Ulcer, J. A. M. A. 73:575 (Aug. 23) 1919.

12. Horsley, J. S.: Clinics and Collected Papers of St. Elizabeth's Hospital 1:171-174, 187, 1922.

operative recovery. The accompanying table shows the end-results.

Those patients who have no indigestion and no symptoms referable to the stomach under the regular ordinary habits of life are classified as "complaint free." There are thirty-two complaint free patients. Patients who are better, but still have some gastric symptoms, are classified as "improved." The "unimproved" have not been benefited by operation. Two patients could not be traced to the present, though both of these were complaint free when last heard from.

Results of Pyloroplasty

Dead 3 (Following operation)				
56	Not traced 2			
	Complaint free 32	Pyloroplasty for:	Uncomplicated duodenal (9) or gastric (1) ulcer	10
			Uncomplicated pyloric stenosis	2
			Duodenal (3) or gastric (2) ulcer, with separation of gallbladder adhesions	5
			Duodenal ulcer, with cholecystectomy	11
			Pyloric stenosis, with cholecystectomy	1
			Duodenal ulcer; cholecystectomy at subsequent operation	1
			Congenital band, with cholecystectomy	1
			Acquired pyloric hypertrophy in adult	1
	Improved 14	Pyloroplasty for:	Uncomplicated duodenal ulcer	2
			Duodenal ulcer with separation of gallbladder adhesions	2
			Duodenal ulcer, with cholecystectomy	6
			Duodenal ulcer; cholecystectomy at subsequent operation	1
			Duodenal ulcer, with aortitis	1
			Jejunal ulcer following gastroenterostomy	2
	Unimproved (now complaint free) 5	Subsequent gastro-enterostomy		4
		Subsequent pylorectomy		1

Fig. 8.—Appearance of margin of ulcer shown in Figure 7: leukocytic infiltration; regularity of epithelial cells; slightly reduced from a photomicrograph enlarged 100 diameters.

Of the thirty-two complaint free patients, ten had a simple peptic ulcer with no adhesions to the gallbladder or elsewhere, and in two there was uncomplicated cicatricial stenosis. In nineteen there were adhesions to the gallbladder. The gallbladder was removed in thirteen patients at the time the pyloroplasty was done; in five, the adhesions to the gallbladder or liver were merely separated; in one case of cholecystitis and no adhesions, cholecystectomy was done at a subsequent operation. In one case there was cicatricial stenosis and an adherent gallbladder; in one, an obstruction by a congenital band; and in one, hypertrophic muscular stenosis in an adult.

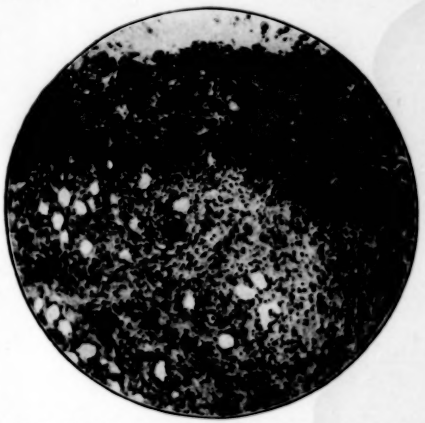

Fig. 9.—Tissue from bottom of ulcer shown in Figure 7. Connective tissue is well organized, with the top layer of leukocytic infiltration. There is no evidence of malignancy.

There were fourteen improved patients. Of these, one is but slightly improved, while five are greatly improved, being almost complaint free; the others are much benefited. In only two of these "improved" patients was there a simple ulcer uncomplicated by adhesions, and one of these is almost complaint free. The other patient is rather fat, with varicose veins, and had a pulmonary infarct during convalescence from her operation. She is very slightly benefited.

In nine of the fourteen improved patients there were adhesions around the gallbladder. The adhesions were merely separated in two. These were early in the series, for now when the gallbladder is adherent it is removed. In six improved patients, cholecystectomy was done at the time of the pyloroplasty, and, in one, stones were removed from the common duct; in one case, cholecystectomy was done at a subsequent operation.

There were five unimproved patients. In one, a young man who had been gassed in France, there were recurrent hemorrhages from the pyloric mucosa till a Polya-Balfour pylorectomy was done. He is now complaint free. In four there were adhesions about the gallbladder at the time the pyloroplasty was done, but the gallbladder was not removed then. They were early in the series. In two of these four patients a cholecystectomy was subsequently done with only temporary relief, and finally the pyloric end of the stomach was ligated with a stout kangaroo tendon, and a gastro-enterostomy was done (Figs. 12 and 13). They are now complaint free. In the other two patients

the adhesions recurred to some extent, but there was also a recurrent ulcer. They were operated on again, the gallbladder being removed and gastro-enterostomy done in both. In one, the recurrent ulcer near the scar of the pyloroplasty was excised, and the duodenal and gastric walls were folded in (Fig. 14). In the other case, with recurrent ulcer in the upper border of the duodenum a half inch from the pylorus, the pyloric end of the stomach was ligated (Fig. 15). Both patients are now complaint free. The roentgenograms and fluoroscopic studies in these four cases were made by Dr. Fred M. Hodges.

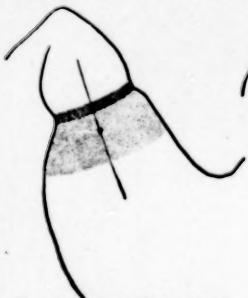

Fig. 10.—Diagram of the stomach, showing the pyloric sphincter, which is cross-hatched, and the pyloric canal, stippled. The pyloric canal is normally about an inch and a quarter (3 cm.) long. The incision for this pyloroplasty should extend no farther than an inch into the duodenum, and into the stomach at least twice the length of the incision in the duodenum. The center of the incision is shown as a black dot. Such an incision will insure division of the most muscular part of the pyloric end of the stomach, and provides that both angles of the wound, when sutured, will be in the wall of the stomach.

Fig. 11.—The incision indicated in Figure 10 has been made. The diagram shows the insertion of two tractor sutures, the first from the extremity of the incision in the stomach to the extremity of the incision in the duodenum, and the second about one-half inch above this. When tied, they approximate these two ends of the incision and make the suturing in three layers comparatively easy.

Recurrent duodenal or pyloric ulcers after pyloroplasty are quite different from jejunal ulcers after gastro-enterostomy. The two recurrent ulcers in the cases just reported were in a region where primary peptic ulcers usually occur and the adherent gallbladder —a potential source of reinfection—had not been removed when the pyloroplasty was done. A jejunal ulcer, however, is almost unknown except as a result of a gastro-enterostomy.

With two exceptions, all of the pyloroplasties were done for ulcer, or the effect of ulcer. In one of these two patients a congenital band had pulled up and narrowed the pylorus; in the other, a man, aged 45, there was narrowing of the pylorus by marked muscular hypertrophy of the pyloric canal. Both of these patients are now complaint free.

The essentials for successful end-results after pyloroplasty are the elimination of active or latent foci of infection (particularly an adherent gallbladder), the selection of proper cases for this operation, and reasonable care in the postoperative medical and surgical treatment.

617 West Grace Street.

Figure 12.

Figure 13.

Fig. 12.—Tracing from roentgenogram of stomach of Mr. W. J. B., taken twenty-five days after gastro-enterostomy. In this case, there was no permanent improvement after pyloroplasty, because of persistently recurring adhesions. The pyloric end of the stomach was occluded with a kangaroo tendon, and a gastro-enterostomy was done. The fluoroscope shows some passage of food through the pylorus. The patient is now complaint free.

Fig. 13.—Tracing from roentgenogram of stomach of Mr. L. W. P., taken nineteen months after gastro-enterostomy, which was performed because of lack of improvement of clinical symptoms after pyloroplasty. The pylorus was occluded with a stout kangaroo tendon. About half of the food now goes through the pylorus. The patient is now complaint free.

Figure 14.

Figure 15.

Fig. 14.—Tracing from a roentgenogram of the stomach of Mr. G. B. S. This patient was not relieved by pyloroplasty. There was a recurrent ulcer near the wound from the pyloroplasty. This was excised and the tissues were infolded and sutured, and a gastro-enterostomy was done. This roentgenogram was taken nine months after the gastro-enterostomy. Practically no food passes through the pylorus. The patient is now complaint free.

Fig. 15.—Tracing from a roentgenogram of the stomach of Mr. J. C., taken ten months after gastro-enterostomy. He was not relieved by pyloroplasty. There was a recurrent ulcer in the upper duodenal border about one-half inch from the pylorus. Fluoroscopic examination shows very little food going through the pylorus, a large majority of it leaving through the gastro-enterostomy. The patient is now complaint free. Of these three cases in which kangaroo tendon was used, the occlusion in this case seems to be almost complete after ten months. In the presence of recurrent ulcer or marked adhesions, simple ligation of the pylorus appears to make a more effective occlusion than is obtained experimentally in the normal stomach of an animal.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. COFFEY, GATEWOOD, NAGEL AND HORSLEY

Dr. Frederick A. Speik, Los Angeles: Dr. Coffey attempts to define pain in the right iliac fossa as being due to a mobile cecum, or one bound down by adhesions. I do not think he throws much light on the uncured appendicitis cases referred to in his quotation of Dr. Lichty's paper, in which it was stated that 60 per cent. of 1,300 cases were uncured. Because Dr. Coffey shows several cases it does not prove the case. The case should be proved before operation. These uncured cases are the result of an incorrect diagnosis. My plea is for accurate work. Sound investigative work is necessary to establish the cause of pain in the right iliac fossa and therefore will bring about fewer operations for appendicitis. Dr. Coffey's paper simply opens the door for more surgery in that part of the body.

Dr. C. H. Magee, Burlington, Iowa: This question of internal hernia has interested me. I fear that in the description of those fossae in the abdomen there have been too many refinements, and consequently it befogs the situation to a great extent. There are only three: one is where the duodenum comes forward from behind the peritoneum; the second under the sigmoid, and the third under the cecum.

We call one the duodenojejunal fossa, the other the intrasigmoid fossa, and the third the subcecal fossa. The intrasigmoid fossa is very shallow, except in children, so we can rule that out. The fossa under the cecum may be under the cecum itself or it may be at the point where the cecum and ileum join. The fossa duodenojejunalis is about an inch deep. Sometimes I have seen it 2½ inches deep. Usually it will take about one finger, but I have seen it when I could introduce two fingers. Dr. Nagel spoke of one form of hernia being behind or in juxtaposition to the vein. I cannot see how that is possible. Really, the vessel interfered with is the artery. If we use a knife to reduce such a hernia we are apt to cut the superior mesenteric artery, and that will lead to the death of the entire small intestine.

DR. B. B. DAVIS, Omaha: A few years ago, many of us were congratulating ourselves that we were reaching some definite conclusion in regard to the method of dealing with gastric and duodenal ulcer; but since then there has been a good deal of a revolution in our views. At present, gastroenterostomy is under suspicion. I do not believe that we are accomplishing what we formerly thought we were. I see a great many patients, not only those operated on by myself but by others, that come back without having the symptoms relieved; often they are worse than they were before operation. When we are operating in cases of that kind we should open the abdomen, without deciding on a particular operation before seeing the conditions that exist. In some cases a gastroenterostomy is the only thing to do. In others, the physiology points to some form of pyloroplasty rather than gastro-enterostomy. I have done the Horsley operation many times, and I have found that in most of these cases I have been able to excise the ulcer. I feel that excision of the ulcer is going to be the final word. My opinion is that gastro-enterostomy relieves in that class of case in which the ulcer might have been cured by medical treatment. In cases of deep indurated ulcers excision is about the only thing to do. In cases in which the induration was so great that it was a question as to whether it was an indurated ulcer or a beginning malignancy, I did a pylorectomy. I find I am doing more pylorectomies right along, especially in cases in which there is a peculiar browning of the ulcer in the region of the pylorus. It seems to me that the results have been more satisfactory than by any form of pyloroplasty or gastro-enterostomy. To be sure, the mortality is a little higher, but the results have been more satisfactory. We should not forget the gallbladder in these cases. I think it was Moynihan who said years ago that in many of these cases there was cholecystitis. I never call an operation complete until I investigate the condition of the gallbladder.

DR. J. EARL ELSE, Portland, Ore.: For some years, patients coming into the office complaining of pain in the lower right quadrant of the abdomen have been passed through the following routine: general physical examination; a roentgenologic examination, including a fluoroscopic examination made at the end of twenty-four hours, as well as at the end of six hours; a study of the gastric contents; examination of the urine and stool, and after operation a study of the appendix. In the study of the records of patients who have been completely relieved by the operation, I find that almost all show one or more of three findings: (1) a definite history of one or more attacks of acute appendicitis; (2) definite tenderness, as shown by the fluoroscopic examination over the cecum at the place of attachment of the appendix, and (3) an appendix that does not empty until after the cecum has emptied. I have had patients who had definite pathologic changes in the appendix, and yet they were not relieved by its removal. Unless the appendix shows gross changes, the probabilities are that even if there are microscopic changes the appendix was not causing the trouble. Pain may be referred from lesions outside the lower quadrant of the abdomen to this part. Recently a patient was referred by an internist with the diagnosis of chronic appendicitis. The roentgen-ray examination showed definite tenderness over the appendix, and pathologic examination of the appendix after its removal showed the evidence of chronic appendicitis. The woman left the hospital apparently cured, but returned three months later with a history of the same pain. At this time she said she was passing a little blood with the stool. Examination of the rectum through a speculum disclosed a small ulcer on the posterior surface about 1 inch above the sphincter. This was painted with 10 per cent. silver nitrate, three or four times, with satisfactory results. The woman has been free from pain since that time.

DR. M. G. WOHL, Omaha: These papers impress on us forcibly that the solution of the surgical approach to the gallbladder, like many other baffling surgical problems, will be found in physiology rather than in morbid anatomy. Luciani, Rost, Judd, Mann and others have contributed to our knowledge of the physiology of the gallbladder, yet we have to admit that the exact function of the latter is still a mooted question. The nausea, gaseous distention and epigastric distress so commonly present in gallbladder disease have been conventionally accounted for on a reflex basis. It would seem to me, however, that these symptoms, in great measure, might be due to the altered gastric secretion, especially hypochlorhydria and achlorhydria, as pointed out by Dr. Gatewood, and the accompanying diminished function of liver and pancreas. From the work of Delinski we know that prosecretin in the mucous membrane of the duodenum, when acted on by the hydrochloric acid of the stomach, is changed into secretin. The latter, entering the blood stream, stimulates the liver and the pancreas. In cases of gallbladder disease, accompanied by absence or diminished amount of free hydrochloric acid, the gastric symptoms might reasonably be explained on this basis. The amount of hydrochloric acid necessary to convert prosecretin into secretin is a problem for the physiologist to determine. In my first series of cases of gallbladder disease, reported in 1917, 55 per cent. of cases have shown either a diminution or a total absence of free hydrochloric acid; in 7 per cent. there was a hyperchlorhydria; in 38 per cent. the free hydrochloric acid was normal. Holweg's figures are as high as 84 per cent. of cases of functionless gallbladders that have shown a deficiency of hydrochloric acid. The pathologic changes of the gallbladder in my cases that have shown a decrease or absence of free hydrochloric acid consisted in an erosion of the epithelium of the villi of the mucosa, with a distortion and destruction of the mucous glands, and with a round cell infiltration within the walls of the gallbladder. I admit that my series of cases is too small to form the basis of a definite opinion, yet I feel that the findings of Dr. Gatewood and others, as well as my own, are significant. It is true that the gastric findings are not going to solve the question of early diagnosis of gallbladder disease, yet I feel that in a case presenting symptoms in the upper right quadrant of the abdomen, a diminution or total absence of free hydrochloric acid will not exclude the gallbladder as the cause of the symptoms, but rather will strengthen the clinical diagnosis.

DR. ROBERT E. FARR, Minneapolis: I have been making some observations on the abdominal viscera of conscious patients. In locating the cause of pain outside the great cavities of the body, we use palpation, traction, and so on, producing effects which we have learned to interpret. Inside the abdomen, however, we have been compelled to do a great deal of guessing because conditions apparently similar produce symptoms which are not alike. Coffey, Lane, Johnson and Wilms do not agree regarding the interpretation of the physical conditions found within the abdomen. I believe that in the future this subject will be elucidated to some extent by the use of what I term the "physiologic test." One may, by the aid of the patient's cooperation and a good psychanesthetist, be able to interpret the conditions found by means of this test. The gallbladder, appendix or cecum, the ovary or the uterus, may be placed under suspicion if by pressure or traction on any one of these the patient's symptoms are reproduced. In more than a hundred observations in which the diagnosis was in doubt, we have received evidence that we consider trustworthy by the use of this method. I believe that at this time, when group medicine is being extensively used, we should not forget that in order to open a patient's abdomen and conscientiously give to him what he should have, we should be acquainted with the psychic condition of the patient and know something about his mentality. It is not sufficient to read the history

that some one else has taken or to operate on a patient for whom some one else has made the diagnosis. In some instances, knowledge of the mental make-up of the patient will clear up the diagnosis without difficulty. As Hertzler says, one should recognize certain of these individuals without difficulty. He describes such a patient as "one who has a drooping mustache, works for $40 a month, and does not play baseball on Sunday."

Dr. Gunther W. Nagel, Rochester, Minn.: I agree with Dr. Magee that simplicity is to be greatly desired in surgery, as in all branches of the medical sciences. The statement, however, that there is only one duodenal fossa and that all duodenal hernias have the same anatomic relationships is overlooking facts for the sake of false simplicity. Moynihan describes nine duodenojejunal fossae. Quain, Spalteholz, Cunningham, Piersol and other anatomists also describe various fossae about the duodenojejunal flexure. Bearing in mind their mode of origin during intestinal rotation, and the process of physiologic adhesions previously described, their possible number and variations can readily be understood. That hernias taking place into different fossae will have different anatomic relationships appears obvious.

Dr. R. C. Coffey, Portland, Ore.: Dr. Speik has mentioned my reference to the fact that Dr. Lichty has said that less than 60 per cent. of 1,300 patients were cured, and suggested that I must have received my inspiration from Dr. Lichty's paper. I have always considered Dr. Lichty a splendid internist. However, I talked on this subject in Pittsburgh as far back as 1913. In the days of heated discussions on the ulcer question, Dr. W. J. Mayo used to say jocularly that he never operated for ulcer until it had had at least seven medical cures. In a similar vein, he also said that before he had done any abdominal surgery, he knew everything in or about the abdomen. He could diagnose any disease in the abdomen with absolute accuracy; but, when confronted with skin diseases, he knew absolutely nothing about them. He could not tell one from another. You will notice that the man who gets the largest percentage of medical cures of ulcer is the man who relies least on the roentgen ray and least frequently sees the inside of the abdomen. The patients I have discussed have had all that Dr. Speik referred to in the question of diagnosis. He has no monopoly on diagnosis, nor has Los Angeles a monopoly on internists. We have them up in Portland, as Dr. Else has said, and most of these patients have gone through the hands of an internist before they reach the surgeon. We operate on and cure those patients whom the medical man has not cured.

Dr. J. Shelton Horsley, Richmond, Va.: I feel exactly as Dr. Davis does—that we must always fit the operation to the ulcer, not the ulcer to the operation. This, of course, means that the ulcer must be excised whenever it is possible to do so; but if excision or cauterization is impossible without great danger, as in a large infiltrating ulcer of the first part of the duodenum, the next best thing to do is to give the tissues complete rest by ligating the pyloric end of the stomach with stout kangaroo tendon, and doing a gastro-enterostomy. This usually permits the ulcer to heal, which is the next best thing to excision. When such an ulcer is in the pyloric end of the stomach, instead of the first part of the duodenum, usually a pylorectomy should be done.

Dr. Gatewood, Chicago: There were two objections that might have been raised to my paper. One was that I used the Ewald test meal rather than the fractional method. Dr. Judd's statistics are based on the latter method. He found in 302 cholelithiasis cases 14.56 per cent. anacid and 32.45 per cent. hypo-acid, making virtually an identical total. Another was that anemia might be the cause of the lowered acidity. Last night, I looked up my statistics on this point and found that anemia evidently played no part. In connection with Dr. Horsley's paper, Dangschaat has suggested that cholecystectomy be done in gastric ulcer patients when resection was impracticable. From my statistics, it is evident that as a means of lowering acidity, removal of the gallbladder would be of little or no value.

A NOTE ON THE PURIFICATION AND ADMINISTRATION OF INSULIN *

N. F. FISHER, A.B., M.S.
CHICAGO

In view of the work recently reported by Mills on absorption of insulin from the intestine, and the work by Best and Scott on the recovery of insulin from urine, it was thought best to report a summary of the results obtained with insulin in a similar type of experiments during the past year. The details of the work will be left for a later communication.

The Doisy-Somgyri-Shafer method of preparing insulin was modified and used with great success. One of the modifications was to precipitate with one volume of 95 per cent. alcohol, whereas the workers mentioned used nine volumes to precipitate the final product. This precipitate, thrown down by one volume of 95 per cent. alcohol, raised the blood sugar of animals when injected subcutaneously. When a small amount was given intraperitoneally to rats or guinea-pigs, death invariably resulted within fifteen minutes. The injection of this substance subcutaneously into diabetic dogs produced abscesses at the sites of injection within two days.

To the filtrate, eight volumes of 95 per cent. alcohol were added, precipitating the active fraction (insulin). A more potent insulin was thus obtained by the removal of the antagonistic substance. By this method, using calf pancreas, one rabbit unit of insulin could be obtained from 1 gm. of pancreas, or 1,000 rabbit units per kilogram of fresh pancreas. The injection of this insulin subcutaneously never produced any local reactions at the sites of injection. Six totally depancreatized dogs were treated, one having already received two injections daily for 210 days. All injections were made in one place within an area of 3 inches in diameter.

The administration of insulin by Thiry fistula was tried on totally depancreatized dogs. There was a prompt lowering of blood sugar to 0.100 or lower, and this level could be maintained if insulin was administered continuously. From two to four hours after the administration of the last insulin, the blood sugar returned to the original level. Similar results were obtained when insulin was introduced into the vagina. Insulin injected into the scrotal sacs of rabbits produces a more prompt fall of blood sugar and acts longer than when given subcutaneously. A greater effect is thus produced per unit of insulin when given by the scrotal route. A normal dog, starved for twenty-four hours, was given 700 units of insulin by stomach tube. There was a slight rise of blood sugar similar to the results obtained by Mills when he gave insulin by mouth.

An attempt was made to learn whether the insulin was excreted in the urine in these cases. When given by Thiry fistula, one half could be recovered from the urine. The amount recovered was determined by the effects produced on the blood sugar of normal rabbits. When insulin was injected subcutaneously into human diabetic patients and diabetic dogs, about one third could be recovered from the urine. Half of the insulin was recovered from the urine of the dog from which 700 units was given by mouth. It might be mentioned

* From the Hull Physiological Laboratory of the University of Chicago.

that this dog did not micturate until twenty-four hours after the administration, during which time much of the insulin might have been destroyed. When insulin is injected intravenously into dogs under barbital, the insulin produces its usual effect on the blood sugar, and is rapidly excreted by the kidneys, so that the entire amount of insulin injected can be recovered from the urine. That is, the insulin recovered from the urine will produce the same effect on rabbits that it would have produced before it was injected into the dog.

THE AFTER-CARE OF POLIOMYELITIS IN VERMONT

ROBERT W. LOVETT, M.D.
BOSTON

The history of the after-care of poliomyelitis in Vermont is of interest as it was the first state-wide work in this field undertaken anywhere in the country, and is today the most fully developed scheme for the after-care of the disease on a state-wide scale which exists. There has been no attempt to make the present account a technical one. It is rather the object of this report to show how the plan of after-care now in operation in Vermont developed, what difficulties were encountered, and how they were met.

In the years 1910, 1911, 1912 and 1913, cases of poliomyelitis were reported in Vermont, but in 1914 there occurred an epidemic of great severity, with a very high incidence across the northern half of the state, and from this epidemic 306 cases were reported. Undoubtedly, not all of the cases were reported; but of those that were, the mortality rate was 23.5 per cent., so that at the close of this epidemic 226 victims were left with varying degrees of paralysis. This was the condition that faced the state board of health, and it was obvious that, unless something was done in the way of treatment, the amount of resulting disability and disabling deformity would be very great.

Vermont is essentially an agricultural community with comparatively few inhabitants; large cities are few, and the specialties of medicine are not highly developed except in one or two medical centers. The state consists of 9,565 square miles of mountainous country, and many of the less traveled roads are difficult to negotiate even in the best of weather. Indeed, in the winter, deep snows and bitter weather make automobiling impossible, and the difficulties of traveling by rail almost prohibit that as a method of getting about.

Knowing the situation, an anonymous friend of the state placed at the disposal of the state board of health a generous sum to be used in the study of the prevention and care of poliomyelitis. It was decided that first an attempt should be made to care for as many of the affected patients as possible, and in December, 1914, I was asked by the state board of health to go to Vermont and undertake the work.

Poliomyelitis is a condition which is attended by high mortality in the acute disease. When the acute stage is over, spontaneous improvement immediately begins and continues for a time, after which disabling deformities are likely to set in. As is well known, in a certain number of instances these deformities cause such disability that the patient becomes a dependent, or in any event, fails to obtain the degree of recovery which would seem possible under favorable conditions of treatment.

On making a survey of the situation it was found to be impossible at this or, in fact, at any other time to see the patients individually in their homes, and it was decided to hold clinics at certain centers in the infected regions to which patients might be brought for examination and direction as to treatment. After consideration, the best solution seemed to be to examine the cases in consultation with the family physician, who was invited to come to the clinic, and to advise with him as to the measures to be followed, as well as to instruct the family in carrying out such exercises and manipulations as seemed advisable.

The first series of free, public clinics for poliomyelitis in this country were conducted in this way in December, 1914, and January, 1915, in the state of Vermont. I was aided in this work by my assistant in private practice, Miss Wilhelmine G. Wright. The most important centers were visited—Burlington, Montpelier, Barton, Rutland and St. Albans—five in all. At this time 212 cases were examined, and physicians and parents were advised as to the care and treatment to be given each patient. There was no provision made for follow-up work after the patient was seen at the clinic, a matter which later proved to be a serious defect in the work, but at the outset the whole proposition was so very uncertain that it seemed best to progress slowly and see what measures were possible.

During the summer—in July, 1915—clinics were again held in the same places, and had the advantage of the presence of Dr. E. G. Martin, at that time assistant professor of physiology in the medical school of Harvard University, now professor of physiology in Leland Stanford University. Dr. Martin was interested with me in evolving a quantitative method of estimating muscle strength, which we used at this time, and which has been extensively used since. Up to this time the strength of the muscles was estimated by hand, and the condition was much as if one were studying typhoid without the advantage of a thermometer. The method proved to be practical, and much of the information derived from the study of the Vermont cases was due to the more accurate method afforded by the so-called spring balance test.

At these July clinics, 122 examinations were made. The patients who had followed the treatment prescribed at the previous clinic showed marked improvement; but it was realized that even better results could be obtained if the advice to parents could be supplemented by the supervision of a trained field worker who could visit the homes and follow up the treatment prescribed. Such a worker was therefore secured and spent two months in Vermont during the summer of 1915, after the clinics, making her headquarters in Burlington. The difficulty of getting about the country because of the rather inadequate train service restricted her work to the care of those patients living in or near the larger centers; but, acting in cooperation with the family physician, the field worker personally supervised the muscle training of the patients with whom she was able to get in touch, and taught some member of each family to give the exercises, massage and other treatment in her absence. At the end of her stay in Vermont, the muscle test given to each patient by Dr. Martin demonstrated beyond question the value of the work and supervision. The tests showed that the improvement in each case was in exact ratio to the amount of training and supervision given.

By the close of 1915, enough new patients had been seen at the summer clinics or had applied to the field worker for treatment to bring the total number of cases under the care of the department up to 261. During the year, 334 clinical examinations were made either by the surgeon or by his assistants.

In June, 1916, the field worker resumed her work and prepared the way for the third series of clinics, which I held in the five centers visited the previous year. In addition to the reexaminations made at this time, forty-two patients who had had infantile paralysis and had not previously been examined came to the clinics and were taken for treatment. No work was done by the department during the autumn, but in the winter the field worker held biweekly clinics in the larger centers, which made it possible for her to give careful supervision to such cases as could be brought to her, and to see the patients at least once in two months.

In 1917, a severe epidemic occurred in the Montpelier district, and, because of the additional demands, two field workers were required. Clinics were held by me in August, with the assistance of the field workers, and 186 examinations were made. During the year 1917, 119 new patients were admitted for treatment, seventy-nine of this number being cases of recent onset. Prior to 1917, the work had been of necessity restricted to the larger centers and the territory immediately adjacent,, and it was limited to those patients who applied to the clinics for treatment. Now, with an extra field worker, for the first time an effort was made by the department to investigate the cases of those near each center who had not reported to the clinics for examination, and all patients needing care were admitted for treatment.

In 1918, the war depleted the staff to such an extent that the work of the department was practically brought to a standstill. No clinics were held, and only fourteen new patients were admitted for treatment during the whole year. At the end of the summer the one worker who had been taking care of the patients, left, and from that time until the spring of 1919 the department ceased functioning and the patients were without supervision.

Meanwhile, the board of health was besieged with requests for help: existing deformities were increasing and new ones were developing; braces had been broken or outgrown; new patients needed examination and advice, so that when the department resumed its activities again in May, 1919, in charge of Miss Bertha E. Weisbrod, the situation was acute. An accumulation of work in arrears required attention, in addition to the need for meeting each day's new demands; a certain discouragement engendered in some of the patients by the interruption of the work and the uncertainty of its continuance had to be met and overcome; 500 or more cases scattered over the northern part of the state had to be followed up—these were some of the conditions that faced the new régime.

An immediate effort was made to get in touch with as many patients as possible and to persuade them to attend the clinics, with gratifying results. In 1919 the first clinics since August, 1917, were held by me in July, and a sixth center, St. Johnsbury, was added at this time. The examinations showed conclusively that the previous work had been well worth doing, as patients who had followed the prescribed treatment of rest, massage and carefully graded muscular exercises had made great gains.

During the year, 418 patients reported for examination—more than had ever been examined in any one previous year, and more than double the number of examinations in any of the three preceding years. During the year 1914-1915, 334 clinical examinations had been made; but this was the year of the epidemic, when excitement was rife and parents seized every opportunity for help. From 1916 through 1918, there were fewer patients at the clinics for several reasons: first, many had been discharged as cured; secondly, a natural reaction had set in—the parents had grown used to the situation and were inclined to let things drift, and thirdly, the element of uncertainty due to war conditions had not been favorable to a growth of the work. The increased number in 1919 shows how fruitful was the effort to counteract discouragement and stimulate interest.

The department inaugurated a new policy with regard to the follow-up work during 1919. Before this time, the visits to the homes of the patients had been restricted to the summer months; and, while clinics were held by the supervising nurse during the winter, only such patients as could be brought to the clinics could be kept under constant supervision. In 1919 the department not only held winter clinics, but also continued to make home visits during the entire year. This is still the policy of the department, and the follow-up work in the homes is carried on without interruption even through the most severe Vermont winter.

Of the cases seen during 1919, there were comparatively few of recent onset, and a number of the old cases had reached the stage at which operations were advisable and braces more essential than continued muscle training. These two outstanding features offered new problems to be solved. Hitherto, braces and other apparatus had been made at an appliance shop in Boston; but the large amount of apparatus now needed called for a more efficient way of handling the situation. An expert in mechanics was therefore secured who was interested and who learned to make the various types of apparatus needed. The results of the experiment were so satisfactory that the appliance shop has become a permanent institution of the department, and has greatly expedited the care and treatment of patients.

The second problem was the matter of the patients now requiring operation. At the end of the second year, and sometimes earlier, deformities begin to arise in poliomyelitis, such as the contraction of the knee or hip, or similar conditions which, although preventable, occur in a certain number of cases. To allow these deformities to go uncorrected is to bid for disability; and the relief of them, in the majority of cases, is a simple matter if the patients are operated on under proper conditions. Up to 1919, a few operations in urgent cases had been performed in hospitals in Vermont, or the patients had been sent to the Children's Hospital in Boston or the Hospital for the Ruptured and Crippled in New York; but the number of operative cases were becoming too numerous to be handled in this way, and it became evident that some definite plan for their care would have to be adopted.

The matter presented certain difficulties, however, because many of the parents were opposed to having operations performed, and a great deal of time had to be spent in educational work before the necessary permission could be secured. When this was finally achieved, the next problem was to find adequate accom-

modations for the increased number of operative cases. In order to secure the best results with the patients from the rural districts, it was important to keep them close at hand until the plaster casts had been removed and all apparatus had been fitted. The remoteness of their homes made it impossible to give them proper supervision in any other way. Therefore it was decided to secure hospital space in Vermont, where the operations could be performed and where postoperative care could be continued as long as possible.

As a result of this decision, in the winter of 1919 two wards of six beds each were rented from the Proctor Hospital, in Proctor, Vt.; a nurse especially trained in orthopedics was placed in charge, and all necessary orthopedic apparatus was procured by the department. Twelve patients were taken to the hospital, December 5, and, December 7, Dr. F. R. Ober of Boston arrived with his staff. He performed operations for two days, and stayed one day longer to observe the condition of the patients. After that he returned for four week ends to perform subsequent operations and to change plaster casts.

By the middle of March, the last patients were discharged; the venture was in every respect suecessful, and the patients showed great improvement. The change in these children, together with the fact that they had been so well cared for and actually happy while in the hospital, did much to mitigate the dread of operations and to remove the prejudice against hospitals in the parts of the country from which these little patients had come. The results in these operative cases were highly satisfactory. Each patient was followed up at home by the field worker, and kept under careful supervision until everything possible had been done to insure a complete recovery. This plan of providing proper postoperative care in the homes, initiated in 1919, has become a permanent part of the regular work of the department.

Throughout 1919, Miss Weisbrod carried on the field work entirely alone, but in the autumn a secretary was provided to assist her in the office and with the records. During the year, sixty-nine new patients applied for treatment.

It will be remembered that prior to 1919 the field work had been restricted to the cases comparatively near the clinic centers, and in 1919 attention was directed toward following up all the cases in and about those centers and getting the patients to report for examination. In 1920, however, a special effort was made to locate all the patients on record in every part of the state, in addition to carrying on the regular work. An assistant field worker was added at this time. It was found that 250 patients had not been seen for two years or more, and all but twenty-four of these were traced. Even the most remote localities were visited, and the condition of each patient, the treatment prescribed, the care in following it, the extent to which disability interfered with education and self-support, and the approximate amount of improvement were noted on each record, in order that a statistical study might be made showing what the work had accomplished. The compilation of the figures was begun in September, and has been continued since that time.

During the summer of 1920, clinics were held in seven centers, and in the autumn three subsidiary clinics were held by Miss Weisbrod with the addition of still another center, making eight clinic centers in all.

By the fall of 1920 there was an increasing number of patients requiring operation, and it seemed desirable to have them where they could be followed up closely and continuously for two or three weeks after operation. It was decided to rent Kimball Cottage, a hospital building connected with the New England Hospital for Women and Children, in Boston. The hospital furnished heat, light, food and laundry, but in other respects the organization was wholly independent, and the department was in complete charge of the cases. Kimball Cottage was opened in November with thirty-six patients from 3 to 26 years of age. They had all been brought to Boston on the same day by train, and were met at the station by the volunteer Red Cross motor service, which carried them to the hospital.

During the year, forty-eight patients in all were operated on at Kimball Cottage. Besides the necessary orthopedic operations, all of the patients were taken care of in the matter of needed operations for tonsils and adenoids; the eyes of all patients were examined, and those needing glasses were fitted; the teeth of all patients were cleaned and all necessary filling and extracting were done. In addition to the excellent physical care given the children, those of school age were supplied with teachers so that they were able to keep up with their classes, and everything possible was done to make them contented and happy.

The scope of the department's work had gradually broadened, and the area covered had increased until in 1920 practically the whole state was under supervision, the surgical care was as good as we could make it, and hospital and postoperative care had reached a high point of efficiency; but there were still problems to be solved. The home surroundings of some of the patients were such that it was impossible to secure the best results if the children had to be sent back from the hospital to face these living conditions. Sometimes it was merely a question of remoteness—the child could not be visited often enough to insure proper care; again, the financial status of the parents or the demands of a large family made it impossible for them to give the necessary treatment at home; and, what was also very important, in many cases a combination of these circumstances made it impossible for the children to attend school at all. This problem was now met, and provision was made for just these children. Through the generosity of a public spirited citizen of Vermont, Ormsbee House, a boarding school for crippled children, was opened in Proctor in January, 1921. This school can take care of eighteen children between the ages of 6 and 12, and although it cannot meet the entire need, because of its size, it is ideal for those to whom it is available. The school is free to those who cannot afford to pay, so that the children who need it most may enjoy its privileges. The house was built especially for them, and has an incline to the second floor, in addition to the staircase; there is a well equipped gymnasium in which exercises and muscle training are given; a real home atmosphere pervades the school, and there is nothing remotely suggestive of institutional life.

Of the children at Ormsbee House, when this was written, five of the fifteen could only crawl when they originally came to the clinics, and now they walk amazingly well, even though braces and crutches are still necessary. All of the children show great improvement from month to month, physically, mentally and in their general attitude; and not only do they have the best

of care and understanding, but they are spared the continual struggle to keep up with the physically normal children that would be inevitable elsewhere. Lessons are given to them in shorter periods than in the schools for normal children, and, in addition to the regular school work, cooking, sewing, handicraft and music are taught.

Summing up the figures for the work during 1920, sixty-eight new patients applied for treatment, 482 home visits were made, and seventy-two patients were operated on.

In July, 1921, Dr. Ober and I held clinics with the addition of a ninth center at Proctor, and Miss Weisbrod conducted subsidiary clinics in May and October. The method of caring for operative cases in 1920 had shown such excellent results that Kimball Cottage was again rented, and was opened Dec. 1, 1921, with thirty-four patients. Forty-one patients in all were operated on here during the year, in addition to which thirty patients were operated on in Vermont, New York or Boston. During the year, 463 patients were under supervision; seventy-nine new patients applied for treatment; 568 home visits were made, and seventy-one patients were operated on.

In 1921, an addition was made to the work that seems to have been as important as any previous extension of activities. A careful study of the patients under the supervision of the department showed that while the greater number of adults were self-supporting, there were a few who, because of their disability and isolation from suitable work, were unable to contribute materially to their own support. In September, 1921, a department of vocational training was started under Miss Margaret B. Ives, a woman especially trained in occupational therapy. She finds suitable work for the patients; furnishes the raw materials needed, to be paid for when the products are sold; gives instruction free, and finds a market for the articles made. The results, interest and appreciation manifested have proved this branch of the work to be well worth the undertaking. Aside from the economic value of enabling these individuals to discharge their debt to the community, the psychologic and moral effect of this work on the patients themselves can scarcely be overestimated, for through it they have acquired independence and self-respect and have been stimulated to real ambition. The work that has been done includes toy making, knitting, loom weaving, basket weaving, Italian needlework, and filet and other types of needlework.

During 1922, no changes of any significance were made in the work of the department. Dr. Ober and I held a series of clinics in nine centers in August, and Miss Weisbrod held clinics in the same centers in May and October. At the clinics in both 1921 and 1922, very few operative cases presented themselves, a situation in great contrast to the conditions of the earlier clinics. It would seem that not only have the operative cases been taken care of, but also the persistent following up of the cases and holding them to treatment have resulted in preventing, in a large measure, the severe deformities requiring operative treatment.

The plan for the after-care of poliomyelitis in Vermont has thus gradually expanded until, from being in 1914 just a series of public clinics, it is now a definitely organized department of the state board of health, functioning the year round and undertaking the supervision of every case of poliomyelitis in the state from the time the quarantine is lifted until the best possible recovery has been made.

Through the various branches of its work, the department endeavors to give the best possible surgical treatment and physical care to its patients; to secure home conditions that will render a satisfactory recovery possible, and to establish the patient as a useful member of the community. Besides carrying on the actual work, the department makes every effort to record all results accurately and to keep such records clear and immediately available so that the statistics compiled therefrom may prove of definite value in the further pursuit of the work and serve as a basis of comparison for any future experiment along the same lines.

SUMMARY

1. In the beginning, the supervision was purely surgical.
2. Then was added after-treatment by a trained field worker.
3. The scope of the field work was enlarged, and the worker investigated cases throughout the state needing treatment, instead of waiting for the patients to be brought to the clinics.
4. A definite plan for handling operative cases was instituted.
5. A school for crippled children was founded.
6. A department of vocational training was established.

CONCLUSIONS

After eight years of experience in the work, it seems fair to present my personal conclusions as to its value and to estimate what has been accomplished. It seems evident to me that the number of disabilities from poliomyelitis has been greatly diminished, and the number of serious resulting deformities is considerably smaller than it would otherwise have been; that the patients have been, on the whole, appreciative and cooperative, and that many of them are now independent, useful citizens, capable of self-support, who otherwise would have been severely crippled if not quite helpless.

At present, some years after a serious epidemic, my impression is that the problem has resolved itself into one largely of after-care, as practically all of the cases are on a level at which they should remain stationary. Unless another epidemic occurs, few surgical problems will arise in these cases; but the continuance of these patients as active, useful individuals depends on their being carefully and persistently followed up. In other words, from being chiefly a surgical problem, the work has become largely a problem of supervision and after-care.

Immediately after an epidemic and for two or three years more, the problem is an acute surgical one with definite requirements in the way of effective following up in the homes. After three or four years, the surgical element becomes less insistent and the follow-up work more so. The study of poliomyelitis seems to indicate that the disease is a periodic one; and, until more is known about the way in which it is transmitted, there is reason to believe that Vermont may be the scene of future epidemics. If this should be the case, the presence of an effective organization such as now exists is a real insurance, as it could be expanded to meet an emergency.

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HODGKIN'S DISEASE AND LYMPHOSARCOMA

A CLINICAL AND STATISTICAL STUDY*

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Hodgkin's disease and lymphosarcoma, while not common conditions, are not rare. Since attention was attracted to this type of disease by the reports of Hodgkin in 1832, and especially by the contributions of Samuel Wilks in 1856 and 1865, much effort has been expended in attempts to determine the etiology, with but little success. Owing chiefly to the work of Dorothy Reed,[1] the pathology of the Hodgkin's type of lymphoma is well established. In general, this is also true of lymphosarcoma, but many cases are encountered in which it is not easy even by careful microscopic study positively to differentiate it from certain allied conditions. Many forms of treatment, medical and surgical, have been tried. Various drugs have been advocated from time to time, but, aside from brief and transient improvement in certain cases, the fatal course of the disease has not been greatly impeded. Nor has surgical excision of notably involved groups of glands been successful, and it is seldom considered at the present time.

The only form of treatment that exerts noteworthy influence on such morbid states is irradiation by means of roentgen rays and radium, used independently or in combination. The intelligent employment of such treatment often yields striking results even in cases in which complications of a more or less serious nature are impending. Many patients are completely restored to normal health, while others are only partially improved. Even in the presence of extensive mediastinal glandular involvement, with or without pleural effusion, it is often possible to cause such adenopathy to disappear and the fluid to be absorbed. Unfortunately, the improvement is not permanent; it may continue for months or even for two or three years or more, but

TABLE 1.—*Patients Living and Dead, Jan. 1, 1923*

Year	Hodgkin's Disease				Lymphosarcoma			
	Cases	Heard From	Living	Dead	Cases	Heard From	Living	Dead
1915	31	20	0	20	6	4	1	3
1916	32	20	3	17	14	10	0	10
1917	27	19	2	17	22	20	4	16
1918	22	14	3	11	24	17	2	15
1919	23	19	2	17	34	25	2	23
Total	135	92	10	82	102	76	9	67

sooner or later recurrence in the same, or in some other, region occurs, and is usually fatal.

There can be no question that systematic treatment by irradiation is of the greatest service in such conditions, and many patients can be kept in relatively good condition for a variable period of time; but whether or not their lives are actually prolonged has not been determined. In undertaking to study this subject, we immediately realized that it would be worthless to ascertain the average length of life of patients treated by irradiation without preliminary investigation of the average duration of the disease without systematic treatment. In order to obtain such information, to serve as a basis for a later study of the actual effect of irradiation treatment on the longevity of such patients, the histories were consulted of all patients registering at the Mayo Clinic for the five-year period, between 1915 and 1920, in whom a definite diagnosis of Hodgkin's disease or lymphosarcoma had been made on the basis of microscopic examination of excised glands. Besides studying the average duration of the disease in these two groups of patients, it seemed desirable to take advantage of this opportunity to gather from the histories as much clinical information as possible; it is the results of this study that we now present.

TABLE 2.—*Patients Living, Jan. 1, 1923, Grouped According to the Decade During Which the Onset of Symptoms Occurred*

Decade	Hodgkin's Disease				Lymphosarcoma			
	Sex*	Age at Onset	Duration of Disease		Sex*	Age at Onset	Duration of Disease	
			Years	Months			Years	Months
0 to 10	♀	6	8	9	0	0	0	0
11 to 20	♂	16	13	0	0	0	0	0
	♀	16	8	0				
21 to 30	♂	20	4	9	0	0	0	0
	♂	21	6	0				
	♂	22	16	0				
31 to 40	♀	32	10	0	♂	30	9	8
					♂	33	6	5
41 to 50	♀	41	5	10	♂	42	3	0
					♂	44	4	2
					♂	48	4	5
					♂	48	6	2
51 to 60	♂	59	6	0	♂	57	7	4
61 to 70	♀	63	6	0	♂	62	7	0
					♀	67	6	2

* In these columns, ♀ indicates female; ♂, male.

That approximately 11 per cent. of each group of patients were living three years or more was not unexpected, but we were rather surprised by the information gathered from a review of these living patients (Table 2).

A detailed review of these cases will not be given, since the value would be considerably diminished by the fact that in several instances complete information concerning subsequent treatment was not available. In some cases, "block" dissection (excision) of enlarged cervical or axillary glands was followed by more or less systematically repeated roentgenization; in other cases, rather indifferent roentgen-ray treatment followed the excision of one or more glands for microscopic study. In some cases, a biopsy was followed by roentgen-ray treatment or injections of Coley's fluid, or both, and in others, the biopsy was not followed by treatment. In only a few cases was the irradiation treatment given in a manner that would now be considered adequate.

The only conclusions, therefore, that may be drawn from these cases are, either that the relatively long life of the patients was due to treatment, or that the condition happened to be unusually chronic, or both factors may have occurred in combination. It is probable that an etiologic factor of low activity, and a comparatively high resistance, combined with an inhibitory influence exerted by the treatment, prolonged the existence of the patient.

From the foregoing data, it is seen that the male is 2.3 times more susceptible to Hodgkin's disease than

* From the Section on Radium and Roentgen-Ray Therapy, Mayo Clinic.

* Read before the Kalamazoo Academy of Medicine, June 12, 1923, Kalamazoo, Mich.

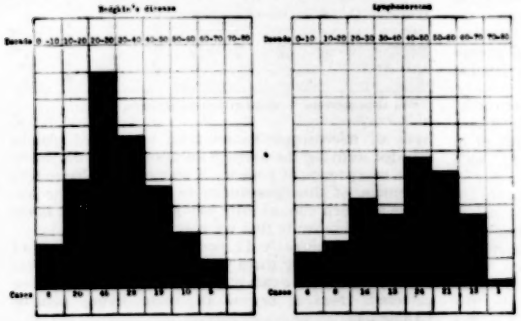
1. Reed, Dorothy M.: On the Pathological Changes in Hodgkin's Disease, with Especial Reference to Its Relation to Tuberculosis, Johns Hopkins Hosp. Rep. 10: 133-196, 1902.

the female, while lymphosarcoma attacks the male 4.4 times more often than it does the female.

In the accompanying charts is shown the rate of incidence by decades. The period of greatest susceptibility to Hodgkin's disease is during the second, third, fourth and fifth decades, with strong emphasis on the third and fourth. Lymphosarcoma is most prevalent during the third, fourth, fifth, sixth and seventh decades, and particularly the fifth and sixth.

TABLE 3.—*Incidence of Hodgkin's Disease and of Lymphosarcoma by Decades (Based on the Age at the Time of Onset of Symptoms), and by Sex*

Decade	Hodgkin's Disease			Lymphosarcoma		
	Male	Female	Total	Male	Female	Total
0 to 10	7	1	8	4	2	6
11 to 20	10	10	20	6	2	8
21 to 30	31	14	45	12	4	16
31 to 40	21	7	28	11	2	13
41 to 50	16	3	19	21	3	24
51 to 60	7	3	10	17	4	21
61 to 70	3	2	5	11	2	13
71 to 80	0	0	0	1	0	1
Total	95	40	135	83	19	102



Incidence of Hodgkin's disease and of lymphosarcoma.

In Hodgkin's disease, the dyspnea or shortness of breath, when present, was always associated with, and caused by, mediastinal adenopathy. Venous engorgement and edema are classified together, because some of the histories made it impossible to separate them; in some instances, the condition was frankly called venous engorgement, while in others apparently the same condition was described as edema. This occurred only in cases in which there was marked mediastinal involvement and pronounced circulatory obstruction. Pruritus, general or local, is not as common as we have believed it to be. More careful investigation might have elicited this complaint in a larger number of cases. Usually, it is general, and causes the patient much distress; it undoubtedly has a toxic basis. In one case, itching occurred only in the skin over the glands, which was red and edematous. In another, pruritus was present only for a short time after the onset of glandular enlargement. It had been our impression, after studying many cases of Hodgkin's disease, that toxic pruritus was associated in most cases with mediastinal involvement, but this proved to be true in only two thirds of the cases in which itching was present. Other skin changes are occasionally encountered; for instance, in two cases there was a general dusky pigmentation or diffuse bronzing. Whether or not this was due to associated suprarenal disturbance could not be determined.

In general, the discussion of Hodgkin's disease applies equally to lymphosarcoma. Indeed, the most noteworthy fact is the close parallelism of the symptoms in both groups, a parallelism which has led many observers to believe that the two conditions are, to say the least, very closely related. Toxic pruritus occurs only one third as often in cases of lymphosarcoma as in cases of Hodgkin's disease; however, since in our cases of Hodgkin's disease it was present in only 9 per cent. of 135 cases, the difference between 9 per cent. and 3 per cent. hardly constitutes a very important point in differential diagnosis.

In both Hodgkin's disease and lymphosarcoma, pain is a frequent symptom and may be of two types. One is due to pressure phenomena, such as enormous mediastinal adenopathy; in some cases abdominal pain was complained of, and was probably due to pressure by masses of enlarged glands. In the late stages of the disease, pain in various bones and joints is quite common. It is not constant in any one location, but moves from one bone or joint to another. Examination of such painful bones or articulations has failed to disclose anything that might account for such pain.

On reviewing the histories, we were impressed by the frequency with which the adenopathy seemed to have a more or less definite relation to common chronic lesions around the mouth and throat, such as bad teeth, diseased tonsils and nasopharyngeal infection. Unfortunately, in many cases the information available was not sufficiently explicit to warrant definite conclusions.

The adenopathic distribution given in Table 5 is of little value per se, because the degree and extent of glandular involvement depends on the particular stage of the condition during which the patients were examined. In many cases of Hodgkin's disease, enlargement of lymphatic glands was limited to certain groups on first examination, while in others the adenopathy was more or less general. In most instances, lymphatic enlargement started in one group of glands, usually the cervical, and gradually spread to other groups as the disease progressed. Definite involvement of the tonsil was observed in two cases of lymphosarcoma. In

TABLE 4.—*The Chief Symptoms in One Hundred and Thirty-Five Cases of Hodgkin's Disease, and One Hundred and Two Cases of Lymphosarcoma*

	Hodgkin's Disease, per Cent.	Lymphosarcoma, per Cent.
Glandular enlargement	100.0	100.0
Loss of weight	54.5	53.9
Loss of strength	50.8	60.8
Fever	31.3	28.5
Pallor	30.0	27.5
Dyspnea or shortness of breath	24.7	22.3
Cough	14.8	11.7
Venous engorgement and edema	13.4	14.7
Pruritus (general or local)	9.0	3.0
Pain (in many cases)	....	....

lymphosarcoma, abdominal involvement is much more common, and in some cases it is the outstanding feature.

The percentage of cases of gastric and intestinal lymphosarcoma represents involvement discovered by exploratory laparotomy. It undoubtedly is more common than these data indicate, but because it produces few and only minor symptoms in most cases, and because slight or moderate intra-abdominal adenopathy is difficult to determine, it is often overlooked.

Moderate leukocytosis is common in Hodgkin's disease, but less so in lymphosarcoma. In one case of Hodgkin's disease, there were 83,000 leukocytes, and eosinophils represented 88 per cent. of the total; in another, the leukocytes numbered only 3,000. In lymphosarcoma, leukocytosis was noted in but twelve cases, in one of which the count reached 247,000, with 93 per cent. of lymphocytes. In this particular case, clinical diagnosis of lymphatic leukemia was made, but the pathologist who examined sections of a gland excised from the left cervical region reported "lymphosarcoma." On reviewing the history of this patient, one cannot escape the impression that he was in the last stages of the disease, and this undoubtedly explains the rapid increase of leukocytosis. Leukopenia, on the other hand, was present in four cases.

METASTASIS

More definite knowledge of metastatic dissemination in Hodgkin's disease and lymphosarcoma would have been of distinct value. Unfortunately, by clinical examination alone, it is impossible to avoid overlooking some of the less prominent manifestations of the disease. Moreover, necropsy findings were available in very few of these cases. In the 135 cases of Hodgkin's disease, definite metastatic lesions were noted in but six instances; in four, it was pulmonary; in one case, there was a subcutaneous tumor between the eyes; and in one, the liver was involved. In the lymphosarcoma group, metastatic foci were noted in the lungs in three cases, in the cecum and left kidney in one; in the suprarenal in one; in the liver in four; in the right tibia in one; in the sternum and right fibula in one; in the abdominal wall in one, and in the chest wall in four. Such information is of little value except to indicate possibilities.

TABLE 5.—*Physical Findings*

	Hodgkin's Disease, per Cent.	Lymphosarcoma, per Cent.
Adenopathy:		
Cervical	86.3	83.3
Axillary	50.4	50.0
Inguinal	36.5	40.3
Mediastinal	32.3	24.5
Abdominal*	11.8	69.4
Nasopharynx, including tonsils	1.5	7.8
Splenic enlargement	14.9	17.6
Stomach	0	6.8
Intestine	0	4.0
Hydrothorax	10.4	0
Ascites	2.2	0
Leukocytosis (11,000 or more)	66.2	11.7

* The abdominal adenopathy referred to consisted of enlargement of mesenteric, biliary and preverterbral or retroperitoneal lymphatic glands determined by palpation or by definite symptoms strongly suggesting such adenopathy; in some cases, the symptoms may have been due to other causes.

TABLE 6.—*Enlargement of Lymphatic Glands Belonging to the Superficial Groups Which Had Remained Unilateral*

	Cases
Left cervical and axillary glands	3
Right cervical and axillary glands	4
Right cervical glands	9
Left cervical glands	7

AVERAGE DURATION OF THE DISEASE

One of the important items of information to be derived from this study is the average duration of the disease, because, without such knowledge, any attempt to compare results of different forms of treatment is a waste of time, at least so far as prolongation of life is concerned. As we have stated, the patients included in these two groups were treated in various ways. Some were given arsenic; others, tuberculin; many had more or less irradiation treatment, and others had block dissection, alone, or followed by irradiation. The period between 1915 and 1920, coincided with the work of Yates and Bunting,[2] and a certain number of these patients were referred to them for treatment by vaccines. Many were treated symptomatically; the majority did not receive systematic treatment. While the results do not supply sufficient data on which to base conclusions with regard to the value of any one form of treatment, they do provide us with a basis from which to calculate the average duration of the disease.

The data here presented will enable us later to determine the effect of systematic irradiation treatment as now practiced. We do not know whether such comparison will show definite prolongation of life, but we do know that such treatment may keep the disease under complete or partial control for varying periods, and that at the present time it is the most effective means of bringing relief to the unfortunate victims.

TABLE 7.—*Average Duration of the Disease From the Onset of Symptoms in Seventy-Three Cases of Hodgkin's Disease and Fifty-Five Cases of Lymphosarcoma in Which the Date of Death Is Known*

	Hodgkin's Disease			Lymphosarcoma		
		Average Duration of Disease			Average Duration of Disease	
Decade of Incidence	Cases	Years	Months	Cases	Years	Months
0 to 10	2	4	0	4	1	4
11 to 20	4	2	9	4	4	1
21 to 30	24	2	11	13	1	11
31 to 40	25	2	7	5	5	1
41 to 50	10	1	8	12	1	8
51 to 60	8	2	3	14	2	7
61 to 70	1	3	0	3	0	4
Total	73	2	7	55	2	5.5

TABLE 8.—*Patients Living*

	Hodgkin's Disease		Lymphosarcoma	
	Patients	Per Cent.	Patients	Per Cent.
One year or less	9	12.7	20	37.0
Two years or less	19	26.0	13	24.0
Three years or less	19	27.0	4	7.4
Four years or less	10	13.7	8	14.8
Five years or less	9	12.7	3	5.5
More than five years	7	9.8	6	11.0

Table 8 shows the number of patients living at the end of one year or less, two years or less, three years or less, four years or less, five years or less, and more than five years. Of the patients with Hodgkin's disease, 12.7 per cent. were living at the end of one year or less, 26 per cent. at the end of two years or less, 27 per cent. at the end of three years or less, 13.7 per cent. at the end of four years or less, 12.7 per cent. at the end of five years or less, and 9.8 per cent. at the end of more than five years. Of the patients with lymphosarcoma, 37 per cent. were living at the end of one year or less, 24 per cent. at the end of two years or less, 7.4 per cent. at the end of three years or less, 14.8 per cent. at the end of four years or less, 5.5 per cent. at the end of five years or less, and 11 per cent. at the end of more than five years.

2. Yates, J. L., and Bunting, C. H.: The Rational Treatment of Hodgkin's Disease, J. A. M. A. **64**: 1953-1961 (June 12) 1915.

Genesis of Antimovements.—It may be asked by the thoughtful man, what is the genesis of these "anti" movements, what impulse drives a sincere man into the pulpit of intolerance and bigotry. Probably the answer is to be found in the elemental passion of mankind for self-advertisement; a loud voice and a gift of the gab can make any partly educated man into a very effective something or other.—*Medical Officer* **30**:4, July 28, 1923.

TREATMENT OF ENCEPHALITIS *

ROSS MOORE, M.D.
LOS ANGELES

For more than two years I have been treating certain patients showing symptom groups referable to the basal ganglions by injecting intraspinally their own blood serum, either untreated or inactivated. To summarize a paper I[1] read a year ago:

Expectant treatment of epidemic encephalitis is frequently unsatisfactory.

At the same time, no other treatment has been found to be more available and useful.

The blood serum of patients suffering from encephalitis has been used intraspinally in this series.

The cases in which it has been used have been for the most part of very long standing and, therefore, there is likely to have been definite destruction of tissue.

In five out of seven cases, temporary but definite improvement has followed these injections.

These results may be due either to the irritating effect of the injections, or to therapeutic substances in the blood serum not present in the cerebrospinal fluid.

The results in this series of cases suggest that symptoms in chronic central nervous disease usually considered permanent may not be so. They may be due to the overwhelming, and consequent paralysis of nerve tissue, by toxic substances. Early relief of such irritation may result in recovery.

Since this paper was written, I have had a considerable experience, including several cases in which Rosenow's antiencephalitis serum was used both intravenously and intraspinally. A statistical summary of the work will not be as useful as the consideration of individual cases, because the series is hardly large enough yet to warrant more than speculative conclusions. My earlier paper is referred to concerning technic and related matters.

REPORT OF CASES

Case 1.—W. G. S., a man, aged 49, married, a mine foreman, complained of tremor in the right arm. The history, except for a light attack of influenza in 1919, was negative. In 1917 the right hand began to tremble and the movements became slow. There was no pain or loss of muscular power. This patient was seen in 1920 and given the ordinary treatment for paralysis agitans with no real relief. In June, 1922, he came back to Los Angeles. At that time examination revealed an intensification of the parkinsonian type of symptoms in the right hand and a masklike rigidity of the face. The cerebrospinal fluid was negative to all tests. From June 22 to Aug. 24, 1922, he received a series of seven intraspinal injections of his own serum. He returned to his work in much better general health, with a definite relaxation of his facial expression and with a small but definite betterment in control of the right hand and arm. After each injection his hand was very much steadier for from two to five days. This was noticeable both subjectively and objectively. The patient was a person of common sense, who was not likely to see improvement when there was none. The improvement in both facial expression and steadiness of the hand was noticeable to many persons who saw him constantly during the period of treatment. For ten days following the third injection, the patient wrote easily with the right hand—a thing he had been unable to do for three years. A diagnosis of Parkinson's disease was made.

To recapitulate, a typical case of Parkinson's disease which had existed for more than five years, with a gradual tendency to get worse, was treated by this method with some apparently permanent results and very marked temporary amelioration of symptoms.

Case 2.—E. M., a man, aged 26, single, a railroad clerk, whose family history and past personal history were negative, and who had not had influenza or acute nasopharyngeal disease during the last four years, took a long automobile ride, Jan. 21, 1923, and in the evening ate boiled noodles in Chinatown. There was no evidence of food poisoning. Next day he felt queer, but went to work. He worked the third day, but felt less able to do so. In the evening his father noted that the patient looked as if something was wrong with him. On the fourth day he stopped work at noon and consulted a physician. Examination by me on the fifth day revealed a classical picture of Parkinson's disease: fixed attitude, semiflexed arms, head thrust forward, mouth open, drooling, eyelids not covering the eyes when winking automatically, gait typical, mind alert. Cerebrospinal fluid recovered under pressure on the sixth day was negative to the usual tests. All symptoms were intensified on the seventh day. Blood was taken for serum on the ninth day, but there was no material change in the general condition. On the tenth day, 30 c.c. of inactivated serum was injected intraspinally at 11 a. m. The nurse's notes indicate a decided improvement six or eight hours after the injection. On the fourteenth day, another injection of 30 c.c. of blood serum was made although the patient had been steadily improving since receiving the first injection. There was no rigidity on the seventeenth day. The patient visited the office on the eighteenth day and said he had fully recovered. He showed some evidence of exaltation in emotional reactions. There was apparently a slight renewal or continuance of lack of quick muscular control. On the thirty-eighth day, he had been at work for five days and had evidently recovered.

These two cases are as unlike as possible in their progress, and yet very much alike in general clinical appearance. The first is thoroughly typical of what we have come to know as Parkinson's disease, or paralysis agitans. The second was just as typical in appearance, but was atypical in onset and progress.

There can be no doubt about the temporary improvement in the first case, an improvement different from and greater in extent than any change I had noted heretofore in the course of treatment of well developed Parkinson's disease.

The second patient remains entirely well five months after the attack. His recovery was spectacular in the extreme. It began directly after the first injection, as is attested by the hospital attendants, who in their more or less calloused and experienced attitude had no expectation of seeing the patient get better.

Twelve or fifteen cases of chronic paralysis agitans have been treated by this method. In more than half these cases, improvement occurred, temporary in nature, but of a quality different from that seen in the course of other treatment. This improvement has been usually in the nature of muscular relaxation. Relief from tremor has not been marked. All patients having a well developed tremor of long standing continued to have it even though very great muscular relaxation was secured.

There were several cases of very acute encephalitis in which the progress was apparently uninfluenced by the injections. There appeared to be an overwhelming infection, as if the protective mechanism of the body was not functioning.

Failure to produce cures in the acute cases was probably due to the absence of antibodies in both the blood and the cerebrospinal fluid. Failure in the chronic cases was due to the same factor and also to the fact that degenerative changes had doubtless taken place.

The temporary recovery in Case 1, when considered in connection with a number of other cases of like

* Read before the Section on Nervous and Mental Diseases at the Seventy-Fourth Annual Session of the American Medical Association, San Francisco, June, 1923.

1. Moore, Ross: California State J. M. 20:387-389 (Nov.) 1922.

nature, is to be explained by the fact that parkinsonian rigidity is, at least in some instances, due to obtunding rather than destruction. The use of the patient's own blood serum intraspinally had the effect of temporarily destroying or neutralizing the obtunding factors. I think that this is a conclusion justified both by this series of cases and by the results seen generally in connection with intraspinal therapy.

At this point one might speculate with much interest about the mechanism of production of tremors as compared with that causing rigidity.

Rosenow's experimental antiencephalitis serum was used in half a dozen cases. In four cases it was given intravenously twenty-four hours before blood was taken for intraspinal use. In the other two it was given intraspinally. Although results were negative, the efficacy of the serum is not disproved thereby, because the cases treated were very extreme ones.

With reference to Parkinson's disease, I am ready to take the same stand as is gradually being assumed regarding general paralysis: that the name is being applied to a group of cases much too large. A diagnosis of general paralysis should be made only when degenerative processes are undeniable. Other cases should be called cerebrospinal syphilis and should be considered amenable to therapeusis.

The syndrome of paralysis agitans should be diagnosed Parkinson's disease only when degenerative central nervous conditions are certain. Other cases should be considered as encephalitis, however much they resemble the chronic incurable form.

In the present state of our knowledge we are unable to say just when nerve cells that are being attacked by infectious disease or toxic processes die. They may be poisoned and inactive functionally a long time before they actually die. If they are inactive functionally, their inactivity will give rise to the same symptoms as their later death. Functional inactivity anywhere in the body is amenable to treatment.

CONCLUSIONS

1. The purpose of this paper is to suggest that even such a chronic disease picture as paralysis agitans is not necessarily the evidence of death and destruction in the central nervous system.

2. It may be due to the abolition of function in the nervous system resulting from poisoning or infection.

3. As such, it is unquestionably amenable to proper therapeusis.

4. Therapeutic effort in the immediate future should be along two lines: (*a*) an increase in the antitoxic qualities of the blood serum used for injection, and (*b*) application of the serum more directly to the seat of the trouble.

628 South Normandie Street.

Mental Hygiene Problem a Study of Man.—In tracing out the thread of mental maladjustment, as it leads back from the hospital into the community, psychiatrists and psychiatric social workers have found themselves facing problems in delinquency, in education, in the home, the social agency, and the like. Each step has led to the next step, so that there has been a gradual unfolding and a mental hygiene program, not in the terms of any one organization but in social thought, is coming to be closely identified with the large questions of human behavior. We are approaching a study of man as man—a study that has never been made.—F. E. Williams, *Modern Hospital* **20**:140 (Feb.) 1923.

Clinical Notes, Suggestions, and New Instruments

FORMULA FOR ESTIMATING NUMBER OF CUBIC CENTIMETERS OF STANDARDIZED BACTERIAL EMULSION TO MAKE BACTERIAL VACCINE OF KNOWN STRENGTH

JENNIE G. DRENNAN, M.D., C.M., OLDS, ALTA.

As many bacteriologic workers are notoriously poor mathematicians, perhaps a formula for the estimation of the correct number of cubic centimeters of a standardized bacterial emulsion necessary to be added to a certain number of cubic centimeters of a saline or oil solution to make a vaccine of a known number of bacteria per cubic centimeter may be helpful.

Example: Thirty cubic centimeters of a vaccine, each cubic centimeter of which shall contain 500,000,000 bacteria, is required to be made from an emulsion, each cubic centimeter of which contains 10,000,000,000 bacteria. By mathematical calculation it will be found that this vaccine must be made up to 28.5 c.c. of saline solution + 1.5 c.c. of the 10,000,000,000 standardized bacterial emulsion.

FORMULA

$$\frac{\text{No. of c.c. of vaccine} \times \text{No. of bacteria required per c.c.}}{\text{No. of bacteria per c.c. of standardized emulsion}}$$

$$= \text{in this case } \frac{30 \text{ c.c.} \times 500{,}000{,}000}{10{,}000{,}000{,}000} = 1.5 \text{ c.c. of emulsion.}$$

As the resulting vaccine must consist of 30 c.c., then this 1.5 c.c. must be subtracted from the 30 c.c., giving 28.5 c.c. of saline, to which the 1.5 are added.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

PROTEIN EXTRACTS DIAGNOSTIC-P. D. & CO. (See THE JOURNAL, Aug. 11, 1923, page 477).

The following products have been accepted:

Goldenrod Pollen Protein Extract Diagnostic-P. D. & Co.; *Tobacco Protein Extract Diagnostic-P. D. & Co.*

Prepared by the methods given in THE JOURNAL, Aug. 11, 1923, page 477.

SOLUTION BRAIN EXTRACT (See New and Nonofficial Remedies, 1923, p. 132).

Thromboplastin-Lederle.—An extract of cattle brain in physiological solution of sodium chloride prepared according to the method of Hess.

Actions and Uses.—See general article, Fibrin Ferment and Thromboplastic Substances (New and Nonofficial Remedies, 1923, p. 129).

Dosage.—For local application, see Solution Brain Extract (New and Nonofficial Remedies, 1923, p. 129). When local application is not possible, 10 to 20 Cc. may be injected subcutaneously or intramuscularly. Thromboplastin-Lederle is marketed in 20 Cc. vials which bear an expiration date, after which the contents should not be used.

Manufactured by Lederle Antitoxin Laboratories, New York. No U. S. patent or trademark.

The potency of thromboplastin-Lederle is tested as follows: Oxalated blood plasma is obtained by adding 2.5 Cc. of sodium oxalate solution 1 per cent. Transfer 0.5 Cc. of oxalated blood plasma to each of a series of tubes, and add 0.2 Cc. of thromboplastin-Lederle to each tube. Also transfer 0.5 Cc. of oxalated blood plasma to each of a control series of tubes and add 0.2 Cc. of physiological solution of sodium chloride. To each tube (and control) add 0.3 Cc. of calcium chloride solution (0.5 per cent.) dissolved in physiological solution of sodium chloride. Thromboplastin-Lederle must cause clotting of the oxalated blood (such as to permit complete inversion of the tubes) within one minute; the controls must fail to show clotting at the expiration of 20 minutes.

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SATURDAY, SEPTEMBER 15, 1923

THE AMMONIA CONTENT OF THE BLOOD

The normal food of man contains less basic radicals (such as sodium, potassium, calcium and magnesium) than acidic radicals, if one includes the phosphoric and sulphuric acids derived from the oxidation of the sulphur and phosphorus of proteins in the body. Consequently, in order to avoid undue accumulation of acids, an effective physiologic mechanism for eliminating the excess is required. The strong, fixed acids cannot be excreted as such at the normal reaction of human urine, which ranges from p_H 4.8 to p_H 7.4. They must be removed as salts with bases. The excretion of acids therefore involves the possibility of depleting the organism of its bases. Fortunately, a substitution of ammonia for some of the requisite fixed bases often occurs, thereby permitting the retention of the latter although the acids are removed. Wilson [1] has pointed out, in a recent discussion of neutrality regulations in the body, that ammonium ions when present in the blood are toxic, so that the usual concentration there is very low. The current teaching maintains that ammonia produced by the deaminization of amino-acid derived from the proteins is ordinarily converted directly into the nontoxic urea, but may be "deflected" from this process in order to serve in the neutralization of excess of acids.

The liver was long regarded as the site of this regulatory reaction. Several months ago, however, Nash and Benedict [2] of Cornell University Medical College put forth the novel hypothesis that the place of ammonia formation in the body is in the kidneys, the small quantities found in the blood being regarded as an "overflow" from these organs into the systemic circulation. Their view was based on the normally low content of blood ammonia, on the fact that in nephrectomized animals it was markedly lower, and that there seems to be a higher content in the renal vein than elsewhere in the circulation. Wilson [1] has remarked that this theory furnishes a much more satisfactory basis for explaining the delicately adjusted mechanism for excreting bases and acids which regulates the acid-base equilibrium of the body. With the formation of ammonia located in the kidneys, he adds, the retention of base by substitution of ammonia, and the retention of base during the excretion of acid radicals by variation in the hydrogen ion concentration of the urine, may be more closely related.

Russell [3] has clearly appreciated that if the ammonia present in the urine has been preformed in the blood and simply excreted by the kidneys, one would expect cases with marked urea retention also to show ammonia retention in somewhat comparable degree. This need not be the outcome, however, if the kidneys are the site of ammonia formation. Estimations of the blood ammonia in advanced renal disease in patients at the London Hospital have shown, in fact, values under 0.1 mg. per cent., which are thus comparable to the figures recorded for normal persons. The Nash-Benedict hypothesis has thus received further support. Blood ammonia is never augmented, but may be decreased when renal functions are suppressed.

1. Wilson, D. W.: Neutrality Regulations in the Body, Physiol. Rev. 3: 295 (July) 1923.
2. Nash, T. P., Jr., and Benedict, S. R.: The Ammonia Content of the Blood and Its Bearing on the Mechanism of Acid Neutralization in the Animal Organism, J. Biol. Chem. 48: 463 (Oct.) 1921; Note on the Ammonia Content of Blood, ibid. 51: 183 (March) 1922.
3. Russell, D. S.: Ammonia Content of the Blood in Nephritis, Biochem. J. 17: 72, 1923.
4. Imperial Cancer Research Fund, Twenty-First Annual Report, 1922-1923, July, 1923, under the direction of the Royal College of Physicians of London and the Royal College of Surgeons of England.

RESULTS OF CANCER RESEARCH

The twenty-first annual report [4] of the Imperial Cancer Research Fund, just issued, summarizes the results of the work of the organization and indicates the present line of attack on the cancer problem. Vitamin deficiency, even when severe enough to be incompatible with life, has apparently no inhibitory effect on the growth of cancer. A deficiency of the water soluble and fat soluble vitamins, developed under the most stringent conditions, produced no effect as to cancer, but experiments were not performed with the antiscorbutic vitamin C. This was considered too dangerous to permit of application to the treatment of cancer in man. The curious fact is also reported that absence of vitamins from the diet produces atrophic lesions similar to those produced by exposure to roentgen ray and radium radiation. Exposure to radium has a profound effect on intestinal activities, and large doses may lead to severe intestinal lesions. There is also an effect on the blood platelets which, if allowed to continue, is associated with an incurable anemia of the pernicious type. The obesity that sometimes follows small doses of irradiation is related to testicular atrophy and hypertrophy of the interstitial cells.

In tissue cultures, the differentiation and loss of differentiation have been reduced to an orderly sequence and can now be reproduced at will. It has been shown that differentiation is absent in cultures of normal kidney and skin when the parenchyma cells are grown in pure culture without the admixture of connective tissue.

The addition of a pure culture of connective tissue, however, is quickly followed by typical histologic differentiation, the kidney producing convoluted tubules with bulblike extremities, and the squamous epithelium keratinizing into cell nests. It is virtually impossible, under experimental conditions, to maintain an exact balance between the two tissues in culture; but the sequence of forms presented by squamous epithelium leaves no doubt that in this lies the explanation of the ordinary range of cell forms known in human pathology and in the tar carcinoma of animals. When cultures of undifferentiated mammary carcinoma of the mouse grew in the presence of an abundance of active connective tissue, the large alveolar masses of polygonal cells became broken up into small trabeculae in which a small lumen appeared, and there resulted a loose adenomatous structure that closely resembled developing mamma. When the connective tissue was removed from the culture, the undifferentiated conditions returned. Drew concluded, therefore, that the loss of differentiation is merely a superficial peculiarity of cancer cells. Even when exhibited in the most superlative degree, the loss of differentiation may be replaced by wonderfully perfect differentiation without in any way affecting the essential malignancy of the cells.

Other experiments may possibly lead to some insight into the essential nature of malignant transformation. It is known that tumors and embryonic tissue grow without delay in a suitable medium, but that adult tissues begin to proliferate only after a considerable lapse of time. The delay with adult kidney tissue, for example, may be fourteen days. But if an extract of adult minced kidney which has been incubated along with the fluid used for extraction is added to the culture medium, growth begins at once in every case. If the extract is made with ice-cold saline solution without incubation, the delay is as long as it is in cultures made without it at all. Now, if a similar ice-cold extract is made from a rapidly growing transplantable tumor, growth starts as promptly as when the incubated extract of minced kidney is used. It may be, it is said, that malignant cells produce automatically and continuously growth-activating substances that normal tissues elaborate only in response to injury. The mode of production of these activating substances, Murray believes, is an essential part of the difference between normal and cancerous cells. This conception helps to explain at least the rôle of irritation in cancrogenesis. It may be imagined, he says, that the specific irritants that are known to lead to the development of cancer set up a slight degree of protoplasmic disintegration which is still compatible with the life of the cell. That sudden change which, after a long period of irritation, marks the beginning of cancer would then correspond to a change in the protoplasm by which the production of the activating substance turns from its purely reactive character to a self-acting process, the result of a sort of education of the cells. Deelman has shown that this preparatory stage can be shortened by combining trauma with the application of the specific irritant.

These experiments will be set forth in detail in a forthcoming scientific report, in which Russell's work in obtaining tar sarcomas in rats will also be published.

THE BLOOD IN INTESTINAL OBSTRUCTION

The severity of the symptoms that follow acute intestinal obstruction or injuries to the bowel that may simulate this condition often seems to exceed what the mechanical factors involved might warrant. The most striking fact is that prompt recovery by no means always attends the removal of the obstruction, so that it has become customary of late to assume an intoxication of widespread physiologic effect as the result of the production of some sort of toxin in the damaged areas. The possible nature and precise etiology of the intoxication still remains in doubt, one of the differences of opinion involving the question of bacterial intervention, as has already been pointed out in THE JOURNAL.[1]

Several years ago, Cooke, Rodenbaugh and Whipple[2] observed that cases of acute intestinal obstruction, whether produced experimentally in animals or occurring in man, are regularly accompanied by a rapid rise in the nonprotein nitrogen content of the blood, amounting to from three to ten times the normal figure. It is, of course, readily conceivable that such an outcome is due to involvement of the kidney functions, though the possibility of accelerated tissue or protein destruction also presents itself. The attempts to determine the etiologic facts have led to some confusion. A recent exhaustive study by Connors, Killian and Eisberg[3] in New York indicates that in simple but complete experimental intestinal obstruction the first change noted in the blood is a rise in the nonprotein nitrogen. This is more rapid, the nearer the obstruction is placed to the duodenum, where the toxemia is most severe. The clinical cases are in general accord with this. In many instances, the urea nitrogen is above normal, but it forms less than half of the nonprotein nitrogen. Following operation, with relief of the obstruction, in most instances there is a steady decrease in nonprotein nitrogen; and this is associated with the clinical improvement in the patient's condition.

When there is an accumulation of the nitrogenous waste products, they follow the order of retention characteristic of renal impairment, namely, a successive rise in uric acid, urea and creatinin. The New York

1. The Consequences of Intestinal Obstruction, editorial, J. A. M. A. **61**: 1988 (Nov. 29) 1913; Intestinal Obstruction, ibid. **63**: 1299 (Oct. 10) 1914; Newer Knowledge Regarding Intestinal Obstruction, ibid. **64**: 1914 (June 5) 1915; The Blood in Intestinal Obstruction, ibid. **67**: 364 (July 29) 1916; The Toxemia of Intestinal Obstruction, ibid. **68**: 914 (March 24) 1917.

2. Cooke, J. V.; Rodenbaugh, F. H., and Whipple, G. H.: Intestinal Obstruction, VI. A Study of Non-Coagulable Nitrogen of the Blood, J. Exper. Med. **23**: 717 (June) 1916.

3. Connors, J. F.; Killian, J. A., and Eisberg, H. B.: Chemical Changes in the Blood in Intestinal Obstruction, Proc. Soc. Exper. Biol. & Med. **20**: 357 (April) 1923.

investigators believe that the extent of toxemia is related to the level of the nonprotein rather than the urea nitrogen; and it depends on the location and type of the obstruction. In any event, they conclude that from the practical standpoint the chemical examination of the blood is of "inestimable value" in preoperative diagnosis and prognosis. It is always encouraging to discover new helps in difficult situations.

THE HEALTH HAZARD OF THE AUTOMOBILE

The pessimist who has exalted the "drawbacks of civilization" will find new additions to his theme in the contemplation of some of the dangers brought by the automobile. The weekly toll of deaths chargeable in one way or another to this motor vehicle is largely exceeded by the number of nonfatal accidents in which health may become temporarily or permanently impaired; and attention is called to a subtle menace in the form of the poisonous exhaust gases from the automobile. Reference has frequently been made to this, for the most part in relation to workers in automobile repair shops and garages. And now the important studies of Henderson and Haggard [1] add a new concern. Their findings are said to apply in all large cities, and to the business portions even of cities and towns of moderate size. One is impressed, in fact, with the statement that the conditions are much more inimical to health than has heretofore been supposed.

The foremost danger lies in the carbon monoxid contained in the exhaust gases. It is colorless, and may be present when there is neither smoke nor smell to betray the obtrusion of something objectionable in the way of unconsumed fuel into the atmosphere. The presence of more than one part per ten thousand in respired air over any considerable period is now admitted to be harmful, or at least objectionable. In some parts of the country the exhaust gases from other types of fuel contain, in addition to carbon monoxid, the toxic vapor of benzene and other substances. Analyses made in New York showed that one part of carbon monoxid in ten thousand parts of air is a quite frequent condition in streets where traffic is heavy; and two parts of carbon monoxid are not unusual. It is asserted that even more than this occurs in limited areas and for short periods, so that subacute asphyxiations may actually become possible not only in confined spaces but also at open posts where traffic policemen are continuously stationed.

Henderson and Haggard believe that the conditions can be ameliorated largely by the use of the vertical exhaust on motor vehicles, whereby the hot toxic gases are carried up out of the streets. The attempt to improve the combustion processes in the automobile is not so immediately practicable. We are not concerned so much here with the chemistry and mechanics of the automobile as with the recognition that methods of prevention are desirable. In any event, the report of these physiologists should make us alert to detect actual cases of poisoning with exhaust gases in every-day practice. The incipient symptoms—headache, fatigue, nausea, disturbances of temper—are familiar. Their etiology is, of course, manifold and by no means always clear.

1. Henderson, Yandell; and Haggard, H. W.: Health Hazard from Automobile Exhaust Gas in City Streets, Garages and Repair Shops, J. A. M. A. 81: 385 (Aug. 4) 1923.

Current Comment

FRÖHLICH'S SYNDROME AND THE HYPOPHYSIS

There is a group of manifestations, including retarded growth, adiposity, sluggishness and lack of sex urge, which is sometimes described under the designation of Fröhlich's syndrome. These manifestations are not only observed at times in man, but have been elicited experimentally in animals by damage to the hypophysis. Consequently, this organ has been held responsible for the absence of Fröhlich's syndrome, and, conversely, the latter has been attributed to a lack of hypophysial function. Experimentation in this field is attended with much uncertainty, particularly because of the difficulty of localizing injuries accurately at the base of the brain. Considerable skill has been developed in recent years, however, in operation on the hypophysis through the oral route. By this technic, involving the further removal of the structure by cautery, Brown [1] of the University of Chicago has demonstrated that completely hypophysectomized dogs may live indefinitely without showing anything of the Fröhlich syndrome, though the latter may be exhibited by some of the animals in varying degrees. These facts seem to indicate, as Brown has pointed out, that the hypophysis itself is not the only factor involved in this malady. The obvious varying or uncontrollable additional factor, he adds, is the injury to the base of the brain in the experimental operations. One is constrained at present, therefore, to look for new developments in the study of the genesis of a group of symptoms that have long been of large clinical interest and have been observed with considerable reliance for their diagnostic import.

THE DEVELOPMENT OF RED BLOOD CELLS

The development of red blood cells is a function of great importance to the organism. What the restoration of a sufficient number of erythrocytes may mean to the body when its circulation has been seriously depleted by hemorrhage or blood-destroying disease is obvious. If it happens, as is currently believed, that a physiologic destruction of red blood cells is proceeding in some degree even in health, their replacement belongs to the continuous normal activities of the hematopoietic tissues. To locate their function in the bone marrow or spleen gives only an incomplete suggestion of what the process may be. There has been considerable embryo-

1. Brown, C. G.: The Effects of Complete Extirpation of the Hypophysis in the Dog (Preliminary Report), Proc. Soc. Exper. Biol. & Med. 20: 275 (Feb.) 1923.

logic evidence that in the earliest stages of the development of the organism the red cells of the blood differentiate intravascularly. For the adult bone marrow it has been taught, on the other hand, that there is a different type of genesis. Thus, the belief that the erythrocytes develop there in extravascular clumps has been so generally accepted that investigators have labored assiduously to discover how the mature red cells formed in this manner make their way into the blood stream. Studies conducted in the Department of Anatomy at the Johns Hopkins University on the bone marrow of both birds and mammals seem destined to present the problem in a new light.[1] When this structure is largely depleted of its myelocytes by suitable procedures and has not yet begun to form new white cells to any appreciable extent, the endothelial membranes come into prominence. It appears there that the red cells arise by proliferation of endothelial cells, which remain in the bone marrow in a relatively undifferentiated state. The erythrocytes are observed only intravascularly, the leukocytes extravascularly. If these findings prove to be tenable, an additional and most important physiologic significance for the endothelium will have been discovered.

A TEST FOR HEPATIC INEFFICIENCY

In 1921, Maclean and de Wesselow [2] showed that a normal adult could ingest 50 gm. of levulose without any appreciable increase in the blood sugar. It was also pointed out that levulose was the only sugar in ordinary use that did not produce a rise in the blood sugar concentration. In the same year, Spence and Brett [3] published the results of a series of cases in which this test was applied. They concluded that in diminished liver efficiency a definite rise in blood sugar resulted from the ingestion of levulose, the height and length of the blood sugar curve being in proportion to the degree of liver inefficiency present. They asserted, further, that the test afforded a means of estimating liver damage in cases of toxic jaundice following administration of arsphenamin and in other diseases of the liver. Covell [4] has recently applied this test in various diseases, particularly amebic dysentery. He used it on a total of fifty-eight patients, giving 50 gm. to those weighing 168 pounds (76 kg.), 40 gm. to those weighing 126 pounds (57 kg.), and 35 gm. to those weighing 98 pounds (44.5 kg.). The blood sugar was estimated immediately before giving the levulose and at intervals of one and two hours after its ingestion. When it failed to return to nearly normal after the two hour interval, hepatic inefficiency was considered present in proportion to the degree it remained high. The tests were controlled by ten presumably normal subjects. Covell concluded that the test forms a valuable means of determining the degree of hepatic inefficiency in amebiasis, and of showing whether liver efficiency has been restored by a course of treatment. It is of value in chronic as well as in acute cases of liver disease, although the response is less marked. The test also forms a valuable indication of hepatic disease in certain cases in which there is no clinical evidence of damage to the liver.

1. Doan, C. A.: On the Intravascular Development of Erythrocytes in the Bone Marrow of the Adult Pigeon, Proc. Soc. Exper. Biol. & Med. 20:260, 1923. Cunningham, R. S., and Doan, C. A.: On the Intravascular Development of Erythrocytes in the Bone Marrow of the Adult Rabbit, ibid. 20:262, 1923.
2. Maclean, H., and de Wesselow, O. L. V.: Quart. J. Med. 14:103 (Jan.) 1921.
3. Spence, J. C., and Brett, P. C.: Lancet 2:1362 (Dec. 31) 1921.
4. Covell, Gordon: The Laevulose Tolerance Test for Hepatic Efficiency and Its Application in Certain Tropical Diseases, Guy's Hosp. Rep. 73:354 (July) 1923.

CIRCULATORY RESPONSES OF MAN TO ANOXEMIA

Physicians are so commonly concerned with the breakdown of some part of man's physiologic apparatus, or with a deterioration of its functions, that they are likely to forget some of the remarkable adjustments of which the human mechanism is capable. There are numerous protective devices in the organism that cannot fail to awaken the enthusiastic admiration of any one who studies them carefully. Among them are, for example, the chemical reactions whereby various harmful substances become detoxified in the body. Again, there are the phenomena of compensatory changes whereby a defect of one part is counterbalanced by a strengthening or hypertrophy of another. Adaptations of the latter sort take place gradually, since they ordinarily involve more or less profound structural changes which cannot be brought about over night. However, sudden physiologic emergencies may elicit equally sudden responses. A striking illustration of this has been described in the case of acute and extreme oxygen want by Schneider and Truesdell [1] as the result of their studies at the School of Aviation Medicine, Mitchell Field, L. I. Extreme anoxemia can be induced, without other complicating factors, by permitting persons to breathe pure nitrogen until pronounced symptoms appear. Under these circumstances, the heart accelerates with amazing promptness. The effect can be detected within the short period of ten seconds, and thereafter the increase in pulse rate continues gradually as long as such an experiment can safely be continued. The return to normal on breathing good air occurs within thirty-five seconds, as a rule. Accompanying alterations in blood pressure appear with almost equal promptness. Thus, there is no waste of time by the organism in responding to the call for more oxygen; and it is fortunate, indeed, that the sensitive nervous system is not permitted to remain long without a vigorous attempt on the part of the circulatory mechanism to prevent it from succumbing to oxygen deprivation.

1. Schneider, E. C., and Truesdell, D.: The Circulatory Responses of Man to a Sudden and Extreme Anoxemia, Am. J. Physiol. 65:379 (July) 1923.

HYPERTENSION IN YOUNG PERSONS

What constitutes an abnormal blood pressure? This question is almost continually before the practitioner; and recently the hygienist has been forced to give attention to it in connection with the propaganda for health conservation. The criterion of hypertension depends somewhat on the age of the person concerned. Current opinion is probably reflected fairly well in the statement that an arterial pressure exceeding 140 mm. of mercury in a young person is abnormal. Although

some years have elapsed since the more general use of the arterial manometer has made the measurement of blood pressure in man part of clinical routine, it is probably still too early to foretell to what extent the "standards" of normal conditions will need to be modified. This expression of pending uncertainty seems further warranted by the data recently published by Alvarez[1] from the University of California. They show that, judged by current standards, hypertension is "very common among the younger men" there, about 45 per cent. of the freshmen having pressures exceeding 130 mm. and 22 per cent. exceeding 140 mm. Among the women in the freshman year, about 12 per cent. had pressures exceeding 130 mm., and only 2 per cent. showed figures above 140 mm. The measurements show, further, that among these persons the average blood pressure for both men and women drops gradually during the first years of adult life. Here are statistics from fifteen thousand young persons, not hospital patients but students admitted to college. Of these, Alvarez asserts that hypertension cannot be ascribed regularly to infections or to the strenuous life. He believes that it is an inherited peculiarity, the appearance of which can be suppressed in women as long as the ovaries function; for in this sex there seems to be a high degree of correlation between the incidence of hypertension and the presence of the various symptoms and signs of ovarian hypofunction. From this standpoint it might be worth while, as Alvarez proposes, to test the effects of ovarian extracts on men with high blood pressure. After all, one cannot forbear to inquire, in the face of all these figures, whether the criteria of hypertension, or at any rate the judgment as to its physiologic significance, are not too severe.

1. Alvarez, W. C.: Blood Pressures in Fifteen Thousand University Freshmen, Arch. Int. Med. 32: 17 (July) 1923.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—Dr. Frank Hausman, Tuscaloosa, superintendent of the Druid City Hospital, has tendered his resignation, effective September 1.

Hospital News.—The new $100,000 Walker County Hospital, Jasper, will be opened about October 10, it is announced. Miss MacLean, superintendent of the Fraternal Hospital, Birmingham, has been appointed superintendent.

Chiropractic Bill Defeated.—Legislation looking toward the establishment of an independent chiropractic examining board was unanimously reported adversely by the committees of house and senate at Montgomery, September 6. This represents final action. Rules were adopted in June giving chiropractors and other drugless healers limited rights to practice in the state, provided they pass the state medical board's examination (THE JOURNAL, July 14, p. 140).

Dr. Harris Establishes Scholarships.—Dr. Seale Harris, Birmingham, has established a scholarship at the University of Virginia Department of Medicine, to be known as the Charles Hooks Harris Scholarship, in memory of his father. This will provide $100 annually to be loaned by the university to a medical student, the loan to bear interest at 4 per cent., and to be returned to the university within four years after the student graduates. Preference is given to applicants from Cedartown, Ga., the birthplace of the donor.——As memorials to his mother and brother, Dr. Harris has founded the Ann Monks Harris scholarship and the James Coffee Harris scholarship at the University of Alabama School of Medicine, Tuscaloosa, and the University of Georgia Medical Department, Augusta, respectively.

CALIFORNIA

A Token of Respect.—In memory of Dr. Olline Burton Doyle, all physicians in the city of Fresno closed their offices for one hour, August 29, during the funeral services.

Warrant Issued for Abrams' Disciple.—It is reported that a warrant was recently issued for the arrest of "Dr. J. E. Martin, Ontario," on a charge of practicing medicine without a state license. Martin is, it is said, a disciple of Albert Abrams.

Chiropractor Pardoned.—H. C. Saunders, chiropractor, Huntington Beach, was released from the county jail recently, having been pardoned by the governor. Saunders, it is reported, was convicted of practicing medicine without a license, and was sentenced before the new law providing for a chiropractic examining board became effective.

Personal.—Dr. Bernard F. McElroy, San Francisco, has been elected a member of the lunacy commission to succeed the late Dr. Daniel D. Lustig.——Dr. Albert K. Dunlap, Sacramento, has been selected by the board of supervisors as superintendent of the county hospital, to succeed Dr. Henry E. Morrison, Sacramento, who recently resigned, following an investigation of complaints by student nurses.

Medical Society to Survey County Hospital.—A committee of five physicians will make a survey of the medical administration of the county hospital, Riverside, and report to the county supervisors in the near future. This, it is reported, is part of the plan of cooperation agreed on by the local physicians and the supervisors when the medical society was given supervision of the medical administration of the hospital. The committee appointed to make the survey includes: Drs. William W. Roblee, Hugh R. Martin, Wendell A. Jones, Bonnie O. Adams and Arthur L. Brown.

State Board Cannot License Chiropractors.—In reply to a query from the state board of medical examiners asking if the board can legally admit and examine certain groups of chiropractors, Attorney-General Webb filed an opinion which read in part as follows:

> Your board is without jurisdiction to examine or license applicants for license to practice medicine as drugless practitioners who have graduated from chiropractic schools. This conclusion is reached because it appears to have been the intent and purpose of the chiropractic act that those persons who seek to practice the system or method of treating the sick and afflicted according to the system or theory known as chiropractic should be licensed and required to qualify exclusively under the chiropractic act and independently of your board of medical examiners.

Sterilization Law to Undergo Test.—California's law which provides for the sterilization of subnormal persons and habitual criminals will soon undergo a test in the supreme court to decide whether it will be enforced, according to Judge Robinson of the Alameda County Superior Court. The law permits the state prison board and the state board of medical examiners to sterilize epileptics, habitual criminals, feebleminded and incurable tuberculous persons, it is reported, but has not been enforced because officials will not take the risk of being sued for damages. Judge Robinson said the enforcement of the law was demanded by the increase in subnormal persons, of whom there were 18,000 in the state prisons, insane asylums and schools for the feebleminded.

COLORADO

State Medical Association Election.—At the annual meeting of the state medical association, at Glenwood Springs, September 6-8, the following officers were elected: president, Dr. Henry Sewall, Denver; vice presidents, Drs. Byron B. Blotz, Rocky Ford; Walter H. Lewis, Hotchkiss; Charles A. Ringle, Greely, and S. Julian Lamme, Walsenburg; secretary, Dr. Frank B. Stephenson, Denver; treasurer, Dr. William A. Sedwick, Denver; delegate to the American Medical Association, Dr. Lewis H. McKinnie, Colorado Springs; alternate, Dr. George F. Curfman, Salida. The next meeting will be in Denver. The council ruled that any member who practices the "Abrams treatment" shall be guilty of unethical conduct. This ruling was approved by the house of delegates. The annual dues were increased in order that a fund may be set aside to use in educating the public in medical affairs.

CONNECTICUT

Hospital News.—The Mount Sinai Hospital, Hartford, has opened and is functioning as a general hospital.

FLORIDA

Personal.—Dr. Joseph B. Farrior has been elected chairman of the bureau of public health and hospitals of the Tampa Board of Trade.

Hospital News.—The contract has been let for the erection of the new addition to the City Hospital, St. Petersburg, at a cost of $75,000.——The new Mercy Hospital (colored), St. Petersburg, has been completed and will soon be ready for occupancy.

GEORGIA

Hospital News.—A new hospital, to be known as the John D. Archbold Memorial Hospital, will be erected at Thomasville. The capacity will be eighty beds.——The Sycamore Hospital, Sycamore, has been reorganized under the name of the Turner County Hospital. The institution will be enlarged and newly equipped.

Tobacco Tax to Support Hospital.—Governor Walker, August 15, signed the Milner tobacco tax act, which levies a 10 per cent. sales tax on cigars and tobacco. The act is effective Jan. 1, 1924. It will raise an estimated revenue of $2,500,000 annually, of which the first $500,000 will be used for the development of the State Tuberculosis Sanatorium, Alto, and the remainder for the payment of amounts due Confederate pensioners. Tobacconists of the state are entering formal protest against the measure.

Personal.—Dr. Theodore Toepel, Atlanta, was recently elected president of the Georgia State Council of Health.——Dr. Burr T. Wise, Plains, was sworn in as a member of the state board of medical examiners, by Governor Walker, August 22.——Dr. Linton Gerdine has been elected president of the board of health of Athens to succeed Dr. John C. McKinney.——Dr. Benjamin F. Bond, Americus, has resigned as county health commissioner of Sumter County in order to accept a position at the United States Marine Hospital, Savannah.

ILLINOIS

Typhoid Epidemic at Peoria.—The state health department is investigating an epidemic of typhoid fever at Peoria, in cooperation with the local authorities. Physicians have reported sixteen cases. It is thought that contaminated milk is responsible for the outbreak.

Record Enrolment at Baby Conference.—The State Fair better babies conference, which opens September 15, has an entry registration of 1,455. This is more than 100 greater than last year, according to the state health department records. A staff of thirty physicians and dentists, twenty-five nurses and about fifty clerks and attendants will be employed during the conference. Since its establishment eight years ago, the baby conference has grown from a registration of 250, and the conference movement has spread over the state. At practically every county fair of importance and at cities many better baby conferences are held on their own merits.

Slight Increase in Poliomyelitis.—Reports to the state department of public health for the first eight months of 1923 show eighty-eight cases of poliomyelitis, whereas for the same period of last year there were fifty-three cases reported. Of forty-two cases of poliomyelitis reported during July and August, twenty-four occurred in Cook County. Typhoid fever cases reported for the eight months were fewer by seventy-seven than for the same period last year. It is believed, says the director, that the letter written to every physician who reported typhoid, calling attention to the use of vaccine on contacts and the fact that vaccine is distributed free by the department, has had a good effect on the typhoid situation.

Physical Examination Campaign Organized.—A conference was held in the office of the director of public health, September 5, to promote a physical examination campaign in line with the National Health Council movement. Sixteen different organizations, including three of the state departments, were represented. An organization was formed with Dr. Isaac D. Rawlings, chairman; Mr. J. W. Becker of the Illinois Tuberculosis Association, secretary, and Mr. Walter Davidson of the American Red Cross, treasurer. A meeting of the board of directors and the finance committee will take place, October 24, when it is expected that the organization will be completed and plans outlined. The national movement has been limited to one year, but it is the purpose in Illinois to establish a permanent institution with the object of stimulating annual physical examinations as a routine matter.

Chicago

Society News.—The third annual meeting of the American Association of Oral and Plastic Surgeons will be held at the Congress Hotel, October 22-23, under the presidency of Dr. Truman W. Brophy, Chicago.——The annual dinner of the Chicago Medical Society will be held, October 10.

Help for Undernourished School Children.—Chicago provides special feedings for her undernourished school children by giving them free at noon a pint and a half of milk, and maintaining sixty penny luncheons at which a child can obtain, for a penny, meat and potatoes, three slices of bread and butter, and cocoa or milk. These children are also put in special classes, of which there are already eighty, and given an hour and a half rest on couches at midday; in cool weather they are also wrapped in blankets. In the course of the school year, more than 6,000 children will be taken care of in this way, according to the director of the special schools. The aim is to help crippled children is the same as with the undernourished.

IOWA

Clinic for Backward Children at State Fair.—The maternity and infant hygiene division of the college of medicine at the University of Iowa is conducting a clinic for backward children at the state fair. This, the first clinic of its kind to be held at the fair, has a staff of two physicians and five nurses, and hereafter will be held annually. It was pointed out by the officials that healthy children are always brought to the fair baby shows, but the subnormal ones who most need attention are left at home and possibly neglected. The clinic only diagnoses conditions found and advises parents to consult their family physician.

KENTUCKY

Mental Clinics Established.—The state board of charities and corrections has recently established mental clinics at the Central, Eastern and Western state hospitals for the insane.

Medical Service for Day Nursery.—The Public Health nursing Association has opened a new medical service for the children of East End Day Nursery, Louisville. Nurses will visit the institution every Monday morning and examine the children who are entering the nursery for the first time. This nursing service is provided to prevent an outbreak of contagious disease.

County Societies Formed.—The Bracken County Medical Society was recently organized, with Dr. William B. Wallin, Brooksville, president; Dr. James C. Norris, Augusta, vice president, and Dr. James M. Stevenson, Brooksville, secretary-treasurer.——The Estill County Medical Society has been formed, with the following officers: president, Dr. Cornelius Marcum, Irvine; secretary, Dr. Samuel T. Scrivner, Irvine, and treasurer, Dr. Alvies Agee, Ravenna.——The Johnson County Medical Society has been reorganized, with Dr. John P. Wells, Paintsville, president; Dr. Green V. Daniel, Paintsville, vice president; Dr. Paul B. Hall, Paintsville, treasurer, and Dr. Ernest E. Archer, Paintsville, secretary.

MARYLAND

Hospital News.—The Colonial Hospital, North Mount Street, Baltimore, has announced the completion of improvements to the hospital buildings. All of the hospital units are now open for the reception of patients.

Personal.—Dr. Charles Edmund Simon, managing editor of the *American Journal of Hygiene*, has been appointed resident lecturer at the School of Hygiene and Public Health of Johns Hopkins University, Baltimore. He will be in charge of the division of filtrable viruses in connection with the department of medical zoology.

MASSACHUSETTS

Physician's License Restored.—It is reported that the license of Dr. Joseph Arthur Levek, Lawrence, was automatically restored, August 22, by the board of registration in medicine. Dr. Levek's license was suspended for one year in August, 1922, on the charge that he assisted in producing an abortion.

Dormitory for Medical Students.—The dormitory fund committee of the alumni of Harvard University Medical School, Boston, organized to raise $1,000,000 for a dormitory for medical students, has agreed on a site at the northwest corner of Pasteur and Longwood avenues. The building will accommodate 250 students. The assembly hall will seat 600.

MICHIGAN

Upper Peninsula Medical Society.—At the annual meeting of the society held at Iron Mountain, August 22-23, under the auspices of the Dickinson-Iron County Medical Society, Dr. Joseph A. Crowell, Iron Mountain, was elected president; Dr. Charles J. Ennis, Sault Ste. Marie, vice president, and Dr. Gereon Frederickson, Iron Mountain, secretary. Dr. Beverly D. Harison, Detroit, secretary of the state board of medical registration, gave an address.

MISSISSIPPI

New Chemistry Building at Medical School.—The new chemistry building at the University of Mississippi School of Medicine, University, which contains the laboratories for biochemistry and toxicology, is completed and will be ready for occupation at the fall term.

MISSOURI

University News.—The addition to McAlester Hall, the medical laboratories building of the University of Missouri School of Medicine, Columbia, is completed and ready for occupancy.——The new University Hospital is also completed. The hospital building and equipment cost in all $250,000.

Report on Treatment of Crippled Children.—A report of the disposition and progress of ninety-seven crippled children who entered on treatment following the St. Louis Medical Society's free clinic last April (THE JOURNAL, August 18, p. 585) was given, August 22, by the committee on public health and instruction of the society. It shows that improvement, ranging from slight to complete correction of physical deformity, was accomplished in ninety-four of the ninety-seven children, only three being returned to their homes as beyond medical or surgical aid. Forty-six of the children were hospitalized an average of forty-seven days; forty were operated on; twenty-eight were supplied with corrective braces; sixteen were put into plaster casts; eight were placed in traction or complete demobilization; eight were referred for hydrotherapeutic treatment, and four were given corrective shoes. More than twenty children are still in hospitals. Twenty-five different diagnoses were made among these patients, fifteen of whom were suffering from more than one ailment. Thirty-five per cent. of the children had had infantile paralysis. The next largest group had rickets. Fourteen children were afflicted with club feet. The medical, surgical and hospital care of the children was without charge to parents who were unable to pay. In addition, the cooperation of public agencies, such as the Children's Aid Society, made it possible for some of the children to be placed in homes. Some children in whom the maximum correction of deformity has been attained are being retained in hospitals so that their general condition can be built up to a degree not possible in their home surroundings.

MONTANA

Plan to Comply with Sterilisation Law.—It is reported that a number of inmates of the state insane asylum at Warm Springs and the school for the feebleminded at Boulder have made application for sterilization since the recent enactment of the law that provides for that procedure, and that plans have been made to comply with the law despite protests filed with the officials. Sterilization, if authorized by the state board, it is said, can be ordered only when requested by parents, legal guardians or the subjects themselves.

NEW YORK

Personal.—Dr. Edward H. Marsh, Brooklyn, has been appointed secretary of the New York State Health Department to succeed Curtis E. Lakeman, who resigned.——Dr. Ellis J. Kellert, Albany, has resigned as head of the Bender Hygienic Laboratory to become head of the laboratory of Ellis Hospital, Schenectady.

New York City

Campaign for College of Pharmacy.—The Kings County Pharmaceutical Society will soon launch a campaign for $300,000 to defray the cost of a new building to replace the Brooklyn College of Pharmacy at 265 Nostrand Avenue. Of the amount required, $125,000 is already on hand. A site for the new college has not been selected.

Free Cancer Clinic at Bellevue.—A department of radiotherapy for the free treatment of cancer will be established at Bellevue Hospital, New York, it was announced, August 31, by Dr. John J. McGrath, president of Bellevue and Allied Hospitals. Dr. McGrath recently returned from Europe, where he studied methods of cancer treatment in the clinics of Hamburg, Berlin, Frankfurt and Leipzig.

Personal.—Dr. Crawford D. Beasley, Brooklyn, was seriously injured in an automobile accident on Fire Island, August 29. He is being cared for in the Southside Hospital at Bay Shore, where it was found that he had a fractured hip and other injuries.——Nicholas Kopeloff, Ph.D., has been granted a year's leave of absence from the Psychiatric Institute, Ward's Island, in order to do research work at the Pasteur Institute, Paris.

A School Nutrition Experiment.—The Dairymen's League Cooperative Association, Inc., has just made public the results of a milk-feeding demonstration conducted by its bureau of nutrition during the last school year in Public School No. 17, in West Forty-Seventh Street. The report shows that in one group of nine classes, composed of boys and girls of various ages, 59 per cent. were underweight in October, 1922, when the experiment began; in June, 1923, eight months later, only 22 per cent. of these children were underweight. The demonstration will be continued during the coming year. It was the opinion of the principal and teachers that the milk-drinking children showed a marked physical improvement and also an increased capacity for mental work.

Laboratory Services by Contract.—Among important legislative measures enacted by the legislature of 1923 is Chapter 638, which authorizes a county or city to establish a laboratory or provide laboratory service by contract, and requires, under certain conditions, that a referendum be held on the question of establishing a laboratory. When the district, site, design and construction of buildings, equipment, work and conduct of a laboratory is approved by the state commissioner of health or his representative, the director of the division of laboratories and research, provision is made for state aid in an amount not exceeding one half of the cost of maintenance, the maximum being $7,500 per annum, and $2,500 toward initial installation and equipment. A county or city previously maintaining a laboratory or providing laboratory service may apply for state aid and, on complying with the requirements of the act, may receive grants from any balance of the appropriation remaining after payments have been made to those establishing laboratories or providing service under the act. Appeals from decisions of the comptroller or state commissioner of health may be made to a laboratory appeal commission.

NORTH CAROLINA

Hospital News.—A new forty-bed hospital was opened, August 15, at Shelby. The institution, erected at a cost of $100,000, was financed by township bond issue. Dr. John W. Harbison has been appointed resident physician.——The new Guildford County Tuberculosis Hospital, near Jamestown, erected at a cost of $100,000, is completed. It is expected to be ready for the reception of patients by November 1.

Personal.—Dr. David A. Stanton, High Point, has been appointed by Governor Morrison a member of the North Carolina State Board of Health to fill the vacancy caused by the resignation of Dr. F. R. Harris, Henderson, who has assumed charge of the health work of Vance County.——Prof. A. H. Patterson, professor of physics and dean of the School of Applied Science in the University of North Carolina, Chapel Hill, will spend a year in study at Harvard University. Prof. Paul H. Dike, who has been in charge of physics at Robert College, Constantinople, for several years, will take Professor Patterson's place during his leave of absence.——Dr. David R. Perry, Lexington, health officer of Davidson County, has resigned, effective, October 1, when he will succeed Dr. Joseph L. Spruill as state clinician of the state sanatorium at Sanatorium. Dr. Spruill resigned to become superintendent of the Guildford County Tuberculosis Hospital, Jamestown, September 1.——Dr. John R. Parker, Burlington, was awarded the honorary degree of LL.D. by Elon College at the recent commencement exercises.——Dr. Forrest J. Lancaster, Lexington, has been elected county health officer to succeed Dr. David R. Perry.

NORTH DAKOTA

Bismarck to Receive Replica of Famous Statue.—Dr. Henry Waldo Coe, Portland, Ore., former president of the North Dakota Medical Association, has informed the state historical society that he will present it with a replica of the equestrian statue of Theodore Roosevelt which he donated to the people of Portland, Ore.

OHIO

Death Rate of Epileptics.—According to the report of the superintendent of the Ohio Hospital for Epileptics, Gallipolis, the death rate at that institution is higher than at any other state institution. The report to the welfare director shows that 101 men and fifty-eight women died during the last year. There are now 1,746 patients in the institution, which was opened in 1893. Since then, 7,811 patients have been admitted, and there have been 2,678 deaths.

Personal.—Col. Benjamin F. Hayden, for more than three years surgeon of the eastern branch of the national military homes, Togus, Maine, has been appointed assistant chief surgeon of all the homes, with headquarters at Dayton.——Dr. Charles A. Files has resigned as superintendent of the District Tuberculosis Hospital, Lima, on account of ill health.——Dr. Jane Nye Gilliford, Middleport, has been appointed health commissioner of Meigs County to succeed the late Dr. James A. Miller.——Dr. Amy A. Kaukonen has resigned as mayor of Fairport and will reside in Seattle.

OKLAHOMA

Hospital News.—Dr. James W. Henry, Oklahoma City, and Dr. Guy W. Taylor, Cardin, have taken over the direction of the new State Drug Addicts Institution at Darlington, the former as medical superintendent and the latter as assistant in charge of clinical work.——The Tulsa County Medical Society recently passed a resolution that a committee be appointed to look into the hospital needs and the general hospital conditions of Tulsa. Dr. A. Ray, chairman, and Drs. Garrett, Thomas W. Stallings, Fred Y. Cronk and Clarence S. Summers were appointed. The chamber of commerce of Tulsa also appointed a committee to see what can be done to expand the hospital facilities and to complete the St. John's Hospital project or to arrange for its transfer to some other organization that will finish it.

PENNSYLVANIA

Pure Food Law Enforced.—During July, thirty-one violations of the pure food law were successfully prosecuted in Pennsylvania. These prosecutions were instituted by food officials against manufacturers and dealers who were using saccharin in their products instead of sugar. Most of these violations came from manufacturers and vendors of soft drinks, and eighty cases concerned the sale of milk and cream which lacked the required fats and solids. Canned milk sold by one dealer contained fat but not milk fat. The continued use of sulphur dioxid and sulphites in food, the use of benzoate of soda without proper labeling, coal tar dyes in fruit syrups, excessive moisture in creamery butter, misbranded food products, and soft drinks bottled under unsanitary conditions were some of the other infringements, according to the report of Director Foust.

Philadelphia

Personal.—Dr. Ward Brinton, Philadelphia, has been appointed by the mayor chief of the new division of tuberculosis.

New Buildings at Temple University.—The state appropriated $45,000 in the last year to Temple University School of Medicine, Philadelphia. This was the second payment of the $90,000 appropriation made by the legislature in 1921. The laboratories of histology and embryology, physiologic chemistry and physiology have been completely reconstructed and equipped, and a new necropsy room installed. Plans have been drawn for the addition of a seven-story wing to the Samaritan Hospital, which will afford ninety additional beds and a new operative suite.

RHODE ISLAND

Hospital News.—The Westerly Hospital obtained $393,000 in its recent drive. The plans call for a $200,000 building, exclusive of furnishings and equipment, which will cost $35,000. The nurses' home will cost, including furnishings, $37,500.

TENNESSEE

Personal.—Dr. Howard C. Stewart, Clarksville, has resigned as head of the Montgomery County health unit. He will be succeeded by Dr. Jesse R. Harris, former city health officer of Tampa, Florida.

Hospital News.—The Hospital for Crippled Adults, Memphis, formerly known as the Presbyterian Hospital, will be opened this month.——The George W. Hubbard Hospital of Meharry Medical College, Nashville, is being enlarged. The General Education Board appropriated $88,000 for this purpose.

Tribute to World War Physicians.—A tablet was unveiled in Confederate Park, Memphis, July 4, bearing the names of four members of the Memphis and Shelby County Medical Society who died in France during the World War: Capt. Robert B. Underwood, Lieut. Abner P. Hubert Sage, Lieut. Grover Carter, M. C., U. S. Army, and Lieut. Norwin Battle Norris, M. C., U. S. Navy.

TEXAS

University News.—A scholarship of $150 a year is now open to undergraduates in medicine at the University of Texas Medical School, Galveston, to be known as the Dr. J. B. Kass Scholarship for Research in Preventive Medicine.——Baylor University College of Medicine, Dallas, has purchased, from the city of Dallas, the three-story building adjoining the present laboratory building, to be remodeled for the autumn session. The departments of pathology, bacteriology and histology will be housed in the new building, while the present medical school building will house the departments of anatomy, physiology, biochemistry and pharmacology.

VIRGINIA

University News.—President Alderman of the University of Virginia Department of Medicine, Charlottesville, has appropriated $25,000 from a previous gift of $250,000 made several years ago by Colonel Payne of New York, to be used by Dr. Alderman in meeting the needs of the institution. This was added to a gift of $50,000 made in 1922 by Mr. McIntyre for a new wing to the university hospital.

WASHINGTON

Personal.—Dr. Howard L. Hull, formerly of the U. S. Veterans' Hospital, Walla Walla, has accepted the position of superintendent and medical director of the Oakhurst Tuberculosis Sanatorium at Elma.

American Society of Clinical Pathologists.—At the second annual convention of this society, Dr. William C. MacCarty, Rochester, Minn., was elected president; Dr. John A. Kolmer, Philadelphia, vice president, and Dr. Ward Burdick, Denver, secretary-treasurer. The funds of the society will be largely devoted to the publication of a journal which will soon be established. The next meeting will be held in Rochester, Minn., the week previous to the American Medical Association session in Chicago.

CANADA

Clinical Society Formed.—A new society, called the Montreal Clinical Society, has been formed in Montreal. The following were elected officers: president, Norman Viner; vice president, Max Rabinovitch; secretary-treasurer, Nathan Freedman; executive committee, Samuel Ortenburg, Samuel Eidlow, Charles J. Gross, Abraham P. Ship and David L. Mendel.

Tuberculosis Dispensaries.—Dispensaries for the treatment of tuberculous people in the Province of Quebec will be established soon throughout the province. The dispensaries will be located in hospitals already established, or in other institutions. The government does not intend to erect buildings of its own. School dispensaries are to be established in Montreal and Quebec, where nurses and physicians will be trained.

Personal.—Dr. George D. Porter, Toronto, has been appointed head physical director at the University of Toronto, succeeding Dr. James W. Barton, who resigned last spring. Dr. Porter will continue his other duties as lecturer on hygiene at the university.——Dr. Henri A. LaFluer, Montreal, has been nominated, by the governor general of Canada, to succeed the late Sir Thomas George Roddick on the Medical Council of Canada.

Canada and Insulin.—In order that the manufacture of insulin can be carried out on the cheapest possible basis,

the Drury government, by order-in-council, recently made a grant of $25,000 to the board of governors of the university in response to a request for the purchase of additional manufacturing equipment. Laboratory equipment worth $18,000 has already been ordered. The work will be under the direction of the Connaught Laboratories.——The University of Toronto's exhibit of the manufacture of insulin at the Canadian National Exhibition, Toronto, is attracting considerable attention, as the original utensils used by Dr. Banting, who officially opened the exhibition, are on display. The university has converted the old Y. M. C. A. building into a plant for the manufacture of insulin under the supervision of Prof. C. H. Best.

Canadian Vital Statistics.—The preliminary summary of the returns of births, deaths and marriages for the year 1922 for the provinces of Prince Edward Island, Nova Scotia, New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia (Dominion Bureau of Statistics) has been published. The total birth rate for these provinces was 24.8 per thousand population, compared with 26.3 for the previous year. British Columbia has the lowest birth rate, with 18.0, and New Brunswick the highest, with 29.2. The infant mortality rate was 86.6, ranging from 64.6 in British Columbia to 103.7 in New Brunswick. Maternal deaths were 5.5 per thousand living births. Alberta was highest with 6.90, and Prince Edward Island was lowest with 3.4. Puerperal albuminuria and convulsions were responsible for most of the deaths. The death rate per thousand population was 10.4 compared with 10.6 in 1921. Cancer accounted for seventy-five deaths in every 1,000, and tuberculosis for sixty-eight. The marriage rate was 7.3 in 1922 and 8.0 in 1921.

GENERAL

Directory of Welfare Agencies.—The Children's Welfare Federation has recently announced that the *Directory of Child Welfare Agencies* is now ready for distribution. This directory gives information regarding all work which is carried on to safeguard and care for children.

Health Laws in Many States.—During recent sessions of state legislatures in forty-one states, legislation pertaining to health was an important activity. It is reported that New York led in the number of health bills introduced, and was followed in order by Illinois, California, Connecticut, New Jersey, Minnesota, Nebraska, Wisconsin, Missouri and Delaware, each having had twenty or more bills to consider.

Priestley Medal Awarded.—At the annual meeting of the American Chemical Society at Milwaukee, September 12, the Priestley Medal, awarded triannually by the society for distinguished services to chemistry, was bestowed on Dr. Ira Remsen, president and professor emeritus of Johns Hopkins University, Baltimore, at ceremonies at Marquette University. Dr. Remsen, who is 77 years of age, is editor of the *American Chemical Journal* and a past president of the American Chemical Society.

Society News.—The American Red Cross will hold its annual meeting in Washington, D. C., September 24-27.——The American Hospital Association's annual session will be held this year in Milwaukee, October 29.——October 25, the New York City Tuberculosis Conference will be held at the Academy of Medicine.——The annual meeting of the Tri-State District Medical Association (comprising Iowa, Illinois, Wisconsin and Minnesota, and districts of surrounding states) will be held at Des Moines, Iowa, October 29-November 1, under the presidency of Dr. Horace M. Brown, Milwaukee.

Iowa-Illinois Medical Society.—At the annual meeting of the Iowa and Illinois Central District Medical Association in Davenport, Iowa, August 30, the following officers were elected for 1923-1924: president, Dr. Frank J. Otis, Moline, Ill.; vice president, Dr. William S. Binford, Dixon, Iowa; secretary, Dr. Karl W. Wahlberg, Moline, and treasurer, Dr. William D. Snively, Rock Island, Ill. Drs. Benjamin H. Orndoff, Dean Lewis and Julius R. Grinker, all of Chicago; Dr. Rood Taylor, Minneapolis, and Dr. Aldred S. Warthin, Ann Arbor, Mich., were among the visiting physicians who addressed the meeting.

Filled Milk Bills Passed.—The legislatures of Washington and Oregon at their 1923 sessions adopted laws which prohibit the manufacture and sale of filled milk products and of margarins containing vegetable oils. The laws in the two states are practically identical. In both states the retail grocers made use of the referendum and succeeded in getting the laws suspended until November, 1924, when they will be voted on by the people of the two states. It is stated that during the next year and a half the people of the two states will continue to use margarin. It is said that this is the first time that a law prohibiting the sale of margarins containing vegetable oils has been passed, and a distinction drawn between margarin and oleomargarin. Advocates of these laws consider them health measures.

Resident and Travel Scholarships to Physicians.—The American Child Health Association has appropriated $10,000 for scholarships for physicians to afford an opportunity to secure training in child health work which will fit them for positions with state and municipal organizations. The fund will be allotted in amounts suited to the objectives arranged for the students. Physicians in good standing in their local medical societies, who present evidence of the following qualifications, will be eligible for these scholarships: (1) graduation from a Class A medical school and a license to practice in the states from which they apply; (2) real interest in child health, and (3) either special instruction or practical experience in public health or child hygiene, including school health work. Preference will be given those having such experience. Scholarships will be available during the school year of 1923-1924 and the summer of 1924. Additional information may be obtained from the American Child Health Association, 370 Seventh Avenue, New York City.

Fellowships of National Research Council.—During the first year of the operation of the fellowships in medicine of the National Research Council, thirty-one persons were appointed for work in various fields of medicine in different institutions. Fourteen of those requesting reappointment were reappointed as follows:

Name	Place of Work	Specialty
Errett C. Albritton	Ohio State University	Physiology
William D. Andrus	University of Cincinnati	Surgery
Barry J. Anson	Harvard Medical School	Anatomy
Michael J. Bent	College of Physicians and Surgeons, New York	Bacteriology
William V. Cone	Iowa State University	Neuropathology
George M. Curtis	Rush Medical School	Surgery-medicine
Loyal E. Davis	Northwestern University	Neurosurgery
Ronald M. Ferry	Harvard Medical School	Biochemistry
William G. Lennox	Harvard Medical School	Medicine
Paul B. MacCready	Johns Hopkins Medical School	Laryngology
Jay McLean	Leipzig, Germany	Surgery
Paul Reznikoff	Harvard Medical School	Physiology-medicine
Sanford M. Rosenthal	Johns Hopkins University	Pharmacology
Gerald S. Shibley	Columbia University, New York	Medicine

Following a recent decision of the medical fellowship board, for a time at least, no fellows will be appointed directly for work in a clinical branch of medicine unless they have served or plan to serve an apprenticeship in one of the medical sciences. New fellows appointed for the year beginning July 1, or shortly thereafter, are as follows:

Name	Place of Work	Specialty
Edwin Cowles Andrus	University of London	Physiology
Howard B. Barker	University of Michigan	Anatomy
Nathaniel Kleitman	Oxford Univ., England	Physiology
David P. Morgan	Harvard Medical School	Biochemistry
Erich W. Schwartze	University of London	Pharmacology
Joseph M. Scott	Johns Hopkins School of Hyg. and Pub. Health	Bacteriology and parasitology
Harry P. Smith	Columbia University	Chemistry and pathology

FOREIGN

Formaldehyd Nondutiable.—The Board of Trade, London, England, has ruled that formaldehyd be excluded from the list of articles chargeable with duty under Part 1 of the Safeguarding of Industries Act.

German Medical Journals Suspend Publication.—The London *Times*, August 23, announces that the *Deutsche medizinische Wochenschrift*, the *Münchener medizinische Wochenschrift* and the *Klinische Wochenschrift* have suspended publication, owing to the exorbitant cost of production.

Child Welfare in Hungary.—The first Hungarian Child Welfare Exhibition was opened in Budapest, July 16. The exhibits were divided into various groups—hygienic, educational and medical. A collection of apparatus for the correction of deformities, a number of skulls of children from the pathologic museum of the pediatric clinic, a series of models illustrating the various diseases of childhood and statistics relating to child accidents were among the exhibits.

Primitive Surgical Instruments Exhibited.—Capt. M. W. Hilton-Simpson, author of *Arab Medicine and Surgery*, has donated, to the Museum of the Royal College of Surgeons of England, a series of primitive surgical instruments used at

the present day by the Shawiya, a Berber tribe living in a remote part of Algeria. The collection includes the primitive bone saw known to Ambroise Paré and modified by Hey. A collection of ophthalmic instruments used in the island of Crete during the Venetian occupation, collected in Crete seventy years ago by Admiral Spratt, were also recently presented to the museum by Colonel Spratt-Bowring.

The International Conference on Cancer.—In this meeting held recently at Strasbourg, Ishikawa pointed out that by painting the inside instead of the outside of the rabbits' ears with tar, the animals are unable to rub it off, and the proportion of "takes" is much larger. He reported 30 per cent. "takes," with 1.8 per cent. metastases. Fibiger emphasized that the experimental cancer continues its evolution after cessation of the irritation. Murray urged special research on the refractory condition entailed by one cancer, which seems to prevent the "take" of a second of any kind. Bayet insisted on the identity of "tar disease" and chronic arsenic poisoning. Bruno Bloch of Zurich reported the production of experimental cancers by the action of the roentgen rays alone, two sittings a week for three years. The advantages of cancer thus produced are the exact dosage thus possible and the invariability of the causal agent. Daels stated that preliminary injection of tar under the skin always prevented the development of cancer above.

International Dental Federation.—The second annual meeting of the International Dental Federation was held at the Sorbonne, Paris, August 6-10, under the presidency of Dr. Truman W. Brophy of Chicago, U. S. A. The federation has given several hundred pounds (sterling) for the relief of dentists in Russia. The Miller Memorial Prize, a gold medal, a sum of money and an illustrated diploma, was presented to Dr. John Howard Mummery, a dental surgeon of London, for work in dental histology. Jensen exhibited a metal plate for a denture which is used among employees in Krupp's factories at Essen. The plate has the appearance of platinum but is very thin stainless steel; five years' use had shown it to be practically unbreakable, and not acted on by the oral fluids. Messrs. Krupp, makers of the metal, have refused to divulge the secret of its manufacture, it was stated. The meeting was opened by M. Maunoury, minister of the interior, in the absence of President Poincaré. An excursion was made to the country home, near Versailles, of Pierre Fauchard, "the father of French dentistry," who died in 1786.

Deaths in Other Countries

Dr. R. C. Ackland, physician and dentist; formerly dental surgeon to St. Bartholomew's Hospital, London, and, during the World War, medical officer in charge of the Red Cross Hospital for Facial Injuries, London; died, August 6, aged 58. ——**Dr. J. Edgar P. Davies,** secretary of the S. Wales division of the British Medical Association.

CORRECTIONS

Treatment of Epilepsy.—In the abstract in THE JOURNAL, August 11, p. 510, the drug used by Maillard and Meignant was phenobarbital, not barbital.

Medical School Exists.—The name of the University and Bellevue Hospital Medical College, New York City (THE JOURNAL, August 18, p. 576), should have been printed in heavy faced type, and in the column under "Classification"; should have been shown rated in Class A from 1907 to 1924.

The Integrity of the Spinal Symphyses.—In THE JOURNAL, July 21, appeared a letter from Dr. L. C. Kellogg, College of Medical Evangelists, Loma Linda, Calif., with the heading, "Impossibility of Moving the Vertebrae." The letter showed the strength of the union between the bodies of the vertebrae and their adjacent cartilages. The title, "Impossibility of Moving the Vertebrae" was placed on the article by the editor. The title should have been, "The Integrity of the Spinal Symphyses."

Discussion on Paper of Dr. Boyd-Snee.—In the discussion on the paper by Dr. Boyd-Snee, published last week, the following was accidentally omitted:

DR. AUSTIN A. HAYDEN, Chicago: The paper contemplates a radical change in the indications for operation in mastoid disease. The following symptoms ordinarily lead to mastoid operation: First, a history of nose and throat infection with the occurrence of pain in the ear and tenderness over the mastoid, a bulging drum, and general symptoms of absorption. That includes temperature, malaise, vertigo, joint infection, heart infection, etc. Up to the present time perhaps the pain and tenderness in the course of an acute otitis media have been given more attention than any one symptom in the diagnosis or decision for operative interference. Scant attention had been paid to the character of the exudate from the tympanic cavity. Now, to subvert these findings almost entirely to the bacteriologic findings in the exudate from the tympanic cavity is of course a most radical change. If I understand Dr. Boyd-Snee's contention correctly, the finding of the streptococcic organism is of little importance. Setting aside these symptoms, the contention that the discovery of the organism in the exudate is of itself an indication for immediate operation is, of course, a most radical departure. This is substantiated by an unusual clinical experience in Dr. Boyd-Snee's cases, an experience backed up by ample postmortem and laboratory confirmatory work. There is just this objection, however: that the general number of these cases occur in one single epidemic, or at least in one locality, and they may well be regarded as a single epidemic of ear infection. Dr. Boyd-Snee saw many of the patients that were not operated on, possibly many of the patients that were operated on late; he saw unfavorable results in his military work, and perhaps in his private work, but I believe that other groups of cases should be studied before these conclusions can be generally accepted. His premise is not sufficiently wide to justify the radical conclusions that are drawn.

Foreign Letters

PARIS

(From Our Regular Correspondent)

Aug. 17, 1923.

Extent of Physicians' Property Rights

As I pointed out in a previous letter (THE JOURNAL, May 19, 1923, p. 1467), the protection of the results of scientific researches in France is still merely a plan and not an accomplished fact; literary productions and artistic creations are amply protected by law. Such legislation is of interest to a large number of physicians. The law is obliged to take account of the ever widening practical applications of art and tends to interpret as broadly as possible the principle of ownership. The utilitarian purpose of an artistic creation cannot be held to deprive it of the protection to which works of pure art are entitled, provided it bears enough of individual stamp to be considered a personal creation. With reference to physicians, the question arose for the first time in connection with a lawsuit instituted by the surgeon Doyen. From the first invention of cinematography, Doyen employed this means for the portrayal of surgical operations. The films were turned over to a custodian, with the understanding that they were to be preserved but that the custodian should have the privilege of showing them at medical gatherings; all other rights were to be retained by Doyen. The custodian, however, sold the films to a motion picture syndicate, which exhibited them to the general public. Doyen thereupon petitioned the courts for a restraining order, setting up his proprietary rights. In this suit the proprietary rights of the physician were clearly and fully established, and today it is universally recognized that the physician who, in the course of his service, produces a work of art possesses all the rights over such artistic production that inure to any author. Surgeons hold proprietary rights over illustrations used in their books. The same is true of models prepared to illustrate conditions in patients, or statuettes that reproduce certain deformities for purposes of instruction. Likewise, roentgenologists hold property rights in their roentgenograms.

In recent articles on the juridical aspects of this question, E. H. Perreau, professor on the law faculty of the University of Toulouse, points out, as one of the necessary consequents

of the proprietary rights in artistic productions, the fact that photographs, roentgenograms, films, models, statuettes, etc., taken of the patients or applied to them cannot be claimed from the physician by the client unless there has been some agreement to that effect. The client is under the same obligations as any one else to respect the property rights of the physicians, and he may not, without the consent of the physician, reproduce photographs, roentgenograms, etc., that the physician has intrusted or given to him. On the other hand, respect for the personality of the client imposes certain restrictions on the proprietary rights of the physician. The rights that every one exercises over his own physiognomy prevents the physician from exposing to public gaze, and particularly by publication in a book, any reproduction of the features or physical peculiarities of the client, which would lead to his recognition, without the consent (at least implied) of the person in question. Any violation of such rights of the client would entitle him to recovery of damages, besides the suppression of the illustration, a suppression that might be disastrous if a book containing the illustration in question has already been put in circulation. Furthermore, if a publication reveals facts that may work harm to the patient, it would constitute a violation of privileged communication. The law decides that even scientific interest cannot be pleaded in defense of a violation of privileged communication on the part of a physician; it furnishes no justification for such a publication even in an exclusively scientific book. A physician desiring to insert such a reproduction in a medical publication must therefore carefully obliterate all marks of identification. The question has even been raised whether the consent of the client would suffice to authorize the publication in a form in which the identity of the person could be recognized.

"Dental Surgeons" and the Doctorate in Medicine

The art of dentistry was long practiced in France without restraint; many dentists were empirics or even out-and-out charlatans, whose shamelessness had become proverbial—"he lies like a tooth puller" was said of a man who lied with effrontery. The law of 1892 regulating the practice of medicine had the effect of elevating the profession of dentistry, in that it established regulations for its control and decreed that the practice of dentistry should be confined to persons who possessed a degree of doctor of medicine or a diploma of "dental surgeon," conferred by the French government on the basis of special studies and examinations taken before the authorities of a state institution for higher medical instruction.

A considerable number of doctors of medicine have devoted themselves to the art of dentistry, and of this profession, in which formerly technical skill was everything, they have made a veritable branch of medicine: stomatology. Not content with what has been accomplished, the dental surgeons would like to raise still further the rank and dignity of their profession by a reform of dental studies. Two main tendencies or schools are manifesting themselves and are giving rise to many lively discussions. These two tendencies are represented by the odontologists and the stomatologists. The odontologists, who comprise especially the professional group of the Ecole dentaire of Paris, would like to see the diploma hitherto granted to the *"chirurgien-dentiste,"* or dental surgeon, replaced by a diploma to be given to a *"docteur en chirurgie dentaire"* (doctor of dental surgery); they recommend, in addition, that there be created a scientific university doctorate for the dental art to be known as the "doctorate in odontology," which shall be open only to those who hold the diploma of a dental surgeon. They demand thus, in reality, two doctorates: a doctorate in dental surgery and a sort of "superdoctorate" to be called "doctorate in odontology"; for the latter one or two years of extra study would be required.

The stomatologists, on the other hand, demand simply the suppression of the diploma of dental surgeon and the substitution of the degree of doctor of stomatologic medicine; they recommend further that temporary measures be adopted to enable the present "dental surgeons" and dental students, to secure the doctorate in medicine.

The program of the odontologists has raised a storm of criticism. For instance, Dr. J. Noir, in a contribution to the *Concours médical*, expresses the fear that the realization of their program would be the beginning of a flood of special doctorates, which would eventually undermine the degree of doctor of medicine and would soon destroy the essential unity of the medical profession.

Dental Hygiene in France and in the United States

One argument that is presented against the extension of dental studies is that the present number of dentists is not sufficient for the needs of the French population. If, it is urged, with the present standard of requirements for the diploma of dental surgeon it is impossible to secure a sufficient number of recruits, how would it be if the degree of doctor of medicine were a prerequisite to the practice of dentistry? In an article on the reorganization of instruction in dentistry, which appeared in the *Revue de stomatologie*, Dr. Sauvez replies to this objection. We often hear it said that there are not enough dentists in France, and our attention is called, at the same time, to conditions in the United States. But, Sauvez remarks, one must take into account the different mentality of the two peoples. From the point of view of dental hygiene, "the mentality of the American people is immeasurably higher than that of the French people." The American people have their teeth cared for and consider, justly, that the care of the teeth is as necessary as the care of any other part of the body. The French people take poor care of their teeth. The more highly educated classes, especially the society people, are about the only persons who go to the dentist. The remainder let their teeth go to ruin. If there were today, in France, double the number of dentists, that would not change the mentality of the people. This mentality, to be sure, began to change under the influence of the war, and gradual improvement may be expected, as the result of the instruction in dental hygiene in common and secondary schools and universities, as the result of the dental care that, according to the new military regulations, will be given our young soldiers, and as the natural result of the more rational treatment of general diseases when the general practitioners shall finally have realized the importance of the teeth, their infections and their presence or absence in the organism.

In this respect, as in so many other fields of hygiene, the Americans have exerted a beneficent influence in France. Dr. J. Noir, in an article in the *Concours médical*, affirms that "the war and the presence in our midst of the Americans, who take especially good care of their teeth, has awakened an increased interest in the hygiene of the mouth, even among the peasants, who were heretofore hard to convince." A dentist told Dr. Noir recently that, since the war, a considerable number of agriculturists living in the environs of Paris were coming to the city to have gold fillings put in their teeth and receive other dental attention—something he had never seen before.

The Number of Dentists in France and in Foreign Countries

The question has been raised whether, leaving out of consideration the United States, it is true that the number of dentists in France is less than that of other countries. Dr. Sauvez gives some interesting statistics. In the German

empire, before the war, there were 3,575 so-called *approbierte Zahnärzte* (graduate dentists), corresponding to the "dental surgeons" of France, and from twenty-five to thirty doctors of medicine practicing dentistry, although they had not received the degree of "*Zahnarzt*," making 3,600 officially recognized dentists for a population of approximately 65,000,000, or fifty-five dentists for each million inhabitants. It is true, there were also about 5,000 persons practicing dentistry without a diploma, which is permissible in Germany, and if we include these nongraduate dentists, we find that Germany had 132 dentists for each million inhabitants. In England, according to the records of the British Dental Association, the number of registered dentists in Great Britain and Ireland at the beginning of 1920 was 5,420 for a population of about 44,000,000. The number of registered dentists in Great Britain at the beginning of 1922 was 5,831. There are no statements in the Medical Register of 1922 in regard to the number of nongraduate dentists, but we know that the number was very large. These data will, however, soon be made known, for the Dentist Act of 1921 is practically a new law regulating dental practice in the British Isles. Whatever may be the number of nongraduate dentists in England, the number of graduate dentists per million inhabitants is about 132.

It will be noted as a coincidence that this figure (132) is exactly the same as that representing the proportion of dentists in Germany, but with the difference that for Germany the nongraduate dentists are included. There are, then, in England a great many more dentists, in proportion, than in Germany. As for our two small neighboring countries, Belgium and Switzerland, in which a graduate diploma is required for the practice of dentistry, we find about 350 dentists in Switzerland for four million inhabitants and in Belgium 600 dentists for eight million inhabitants. Thus, in Switzerland, where the teeth of the inhabitants are very bad, though the people take proportionately better care of their teeth than in France, there are only eighty-seven dentists for each million inhabitants. In Belgium the proportion is seventy-five per million inhabitants.

In the face of these figures, let us inquire into the proportion of dentists in France. According to the most recent and the most complete information that Sauvez was able to secure, there are in France about 5,000 "*chirurgiens-dentistes*" and 700 "*médecins stomatologistes*," or a total of about 5,700 for a population of less than 40,000,000. In other words, the proportion of dentists in France, including the so-called dental surgeons and the stomatologists, is about 140 specialists for each million inhabitants.

Of the five countries whose statistics we have inquired into, France has the largest proportion of graduate dentists, and England has evidently the largest proportion of dental specialists if we include both graduate and the nongraduate dentists.

It is of historical interest to note that, in 1790, there were only five dentists in Paris; in 1814, twenty; in 1828, about 140, 100 of whom were doctors of medicine. In 1841 the number of dentists in Paris had passed the 300 mark.

Distribution of Dentists in France

At present, of the 5,700 dentists or stomatologists in France, there are 1,500 at Paris and in the department of the Seine; that is, more than 25 per cent. of the total for approximately 5,000,000 inhabitants, while there are only 4,200, less than three quarters, for the other departments with a population of 35,000,000. According to Sauvez, nine tenths of the dentists are located in the large cities. The small towns often have not a single dentist, but in many regions the dentists in the large cities make a practice of spending one or two days each week in the neighboring small towns. However, to judge from recent 1923 reports, towns of less than 10,000 inhabitants are beginning to have one or two dental practitioners.

Truss Manufacturer Sentenced for Fraud

A case that was tried recently before the correctional court of Mamers (department of Sarthe) shows to what length charlatanism may go in the illegal practice of medicine. A farmer who had received several circulars announcing the sojourn of a "hernia specialist" at Mamers went to the address indicated. He found himself in the presence of a representative of a manufacturer of hernial supports, who requested him to remove his clothing, and who examined him; he then invited him to be seated and to count up to forty. Hereupon he announced that the farmer was suffering from hernia, which would require two years' treatment to cure and would entail a cost of 1,600 francs. When the peasant refused to pay this sum, he consented to grant a rebate of 600 francs. The client still refusing to accept his offer, he showed him an illustration representing a man suffering from an enormous eventration, and said: "This is what you are coming to if you do not take care of yourself. Your hernia will become strangulated; you won't be able to work and you will soon be confined to your bed." Frightened by this prognosis and this dreary outlook, the farmer then consented to purchase an apparatus at the price of 1,000 francs, of which sum he paid, by way of earnest money, 150 francs, the balance of 850 francs having been paid on receipt of two appliances, one for day wear and one to be worn at night.

It happened that the peasant was suffering from a hydrocele. The manufacturer's agent was perfectly aware of that fact, but, since he had received from his employer instructions "not to let a client off with less than 500 francs a year," he made the peasant believe that he had a hernia. In the illustrated prospectus of the manufacturer, which was sent to the homes, it was stated that "hernia is a great menace to life. Almost all persons with hernia die from this infection in the full strength of their years," and it went on to say that hernia is hereditary but can be radically cured, and that hundreds of unfortunates owe their good health to the appliances manufactured by the house in question.

The court declared the manufacturer and his representative guilty of fraud, and sentenced the former to two months in prison, together with the payment of a fine of 2,000 francs. The manufacturer's agent was given a sentence of one month in prison. They were also compelled jointly to return to their client the sum of 1,000 francs.

Aside from the question of fraud, illegal practice of medicine may also be charged in such cases. If a client merely requests a salesman of surgical supplies to take his measure for an appliance suitable for his infirmity which has been previously diagnosed by a physician, the seller could not under those circumstances be charged with having practiced medicine illegally. The merchant even has the right to show his client the method of using the appliance that he has sold him; for example, the method of applying a bandage or of wearing an orthopedic girdle. But if the patient comes to a surgical supply house and asks to be examined to see whether he has a hernia and needs a truss, the merchant must refuse to give a diagnosis, since he is not a physician. If he sells a patient a truss after having examined him and given his opinion as to the diagnosis, he may be found guilty of fraud, either separately or combined with illegal practice of medicine, and may also be charged with having caused wounds through imprudence, for, filled solely with a desire to sell an apparatus, a merchant sometimes applies trusses improperly over lesions that are not hernias. Serious disease processes and disorders have been noted as the result of the application of a truss over a hydrocele or an inguinal adenitis.

LONDON

(From Our Regular Correspondent)

Aug. 27, 1923.

The Cancer Menace

The ministry of health has issued a circular to the local health authorities stating, in nontechnical language, the present status of our knowledge of malignant disease as summarized by a departmental committee on cancer of experts appointed for the purpose. Apart from the appointment of this committee, the minister has directed the medical intelligence service of the department to keep in touch with the developments of cancer investigation, and the department undertakes the prosecution, in regard to cancer, of researches of an epidemiologic and statistical character, both at home and abroad. The circular points out that in the space of two generations the recorded mortality of cancer has trebled. This increase cannot wholly be accounted for by longer life or better diagnosis. On the other hand, the death rate from cancer is not now increasing for men up to 45 years, and for women up to 60. The most rapid increase is occurring in extreme old age. Hereditary predisposition to cancer has not been proved to be of any practical importance in the case of man. Nor can it be said that the use of any particular food increases the liability to cancer or prevents it from occurring. The idea of "cancer houses" is unsupported. Cancer has not been proved to be infectious or contagious. The danger of long-continued irritation, such as from a clay pipe on the lip or a jagged tooth, is indicated. It is urged that every form of chronic irritation, suppuration or ulceration be treated at once. Early recognition not only of cancer but also of precancerous states is important. The public should know that cancer in its early stages is almost invariably not accompanied by pain, and is sometimes painless throughout. The good results of operation in early cases and treatment by radium, roentgen rays and diathermy are mentioned, and a warning is given against recourse to quack remedies.

The Health of London

The annual report of Sir William Hamer, health officer for London, has just been issued. He points out that the wet, cool summer resulted in a remarkable diminution of infantile diarrhea, the mortality for infants under 1 year being 6.26 per thousand births, as against 18.6 in 1921, and 24.2 on the average of the four years 1911-1914. The general death rate was 13.5 per thousand, one in excess of that for the previous year. Typhoid fever continued to decline, only 264 cases being notified. As the table shows, the infant death rate has been steadily declining in recent years:

Infant Death Rate—Under One Year Per Thousand Births

1915	1916	1917	1918	1919	1920	1921	1922
112	89	104	108	85	76	81	75

There were sixty-five cases of smallpox, of which twenty were fatal. The majority of these cases, possibly all of them, were primarily due to the nature of the illness being overlooked in the first instance. The bulk of the cases occurred in an institution in which vaccination had fallen into abeyance. London was not invaded by mild smallpox, which has been prevalent in the North and Midlands for two years. Measles caused 1,563 deaths in 1922; whooping cough, 1,128; scarlet fever, 301, and diphtheria, 1,145. The death rates from "consumption" were: men, 2,841, and women, 2,047, giving a total death rate of 1.08 per thousand, as against 1.07 in 1921.

The twenty-fifth annual report of the Metropolitan Asylums Board (the body that controls the fever hospitals of London) for the year ending May 31, 1923, has just been issued. The year 1922 was the third from the beginning of high prevalence of infectious disease in London. The incidence here of scarlet fever and diphtheria fluctuates greatly. In 1922, the incidence fell rapidly toward normal, and the fall has continued in 1923, so that London appears now to be on the way to an interepidemic trough. A remarkable feature of the epidemic years was the increase of diphtheria. The number of cases rose from 2,551 in 1921 to 3,237 in 1922. In 1922-1923, the incidence of diphtheria gained to a greater and greater extent on that of scarlet fever, overtaking it in October, and exceeding it for many months late in 1922 and early in 1923. This phenomenon has been observed only once before during the last thirty years.

The Smallpox Epidemic

The number of cases of smallpox continues to decline. In the last weekly return the number of fresh cases was twenty-eight, of which twenty occurred in Gloucestershire. At Gloucester, there are now only a few mild cases. As previously stated, the epidemic in that city has been remarkably mild. The authorities are showing vigor in carrying out the law. One man has been fined $25 for obstructing the removal to a hospital of his daughter, who was suffering from smallpox. Dr. Hadwen, the antivivisection and antivaccination leader, paid the fine. He submitted that there was sufficient accommodation for isolation in the defendant's house. He also said that another physician and he were perfectly convinced that the case was a mild form of chickenpox. Those readers who know anything of his recent American campaign will not be surprised at the mischief his position as a physician enables him to do.

Tour of British Medical Students

A party of eighteen British medical students has started on a three weeks' tour of the principal European hospitals. They are visiting the most famous clinics in France, Belgium, Holland, Germany, Czechoslovakia, Austria and Switzerland. The tour has been arranged by the National Union of Students. In each country the party will be met and taken in charge by medical students on the spot, who will look after their English guests and assist the authorities of the hospitals in showing them everything of interest. The National Union of Students pays especial attention to providing opportunities of this kind for its members. It has arranged tours for agricultural students to Denmark, for engineers to Switzerland and Germany, and for chemists to Czechoslovakia. All these trips are carefully carried through with the help of the university students in the countries visited. They not only provide educational advantages for British students, but also serve to promote a good international understanding among the countries of Europe.

The Spahlinger Serum

The press campaign in support of Spahlinger's claim that he has discovered a cure for consumption continues, but, as yet, the ministry of health has declined to do more than state that the matter is one for investigation. Impressed by this campaign, some of the approved societies (friendly societies recognized by the government under the National Insurance Act) desire to use their funds in order to secure treatment by Spahlinger's serum for their members. The ministry of health has refused to sanction this. The Lancashire Insurance Committee asked permission to grant $5,000 to assist in securing the serum for Lancashire consumptives, but the minister of health replied that neither the government nor the approved societies could legally make this grant. It has therefore been decided that a party of representatives of the societies will visit Spahlinger's laboratories at Geneva and that afterward a public appeal for funds will be made. How the lay representatives of approved societies can

decide the question of the value of Sphalinger's serum, on which experts cannot make up their minds, is a difficulty that does not appear to have been considered.

Light and Heat from Sewage

At a recent conference of the Royal Sanitary Institute, a paper was read by Mr. Arthur Martin on "Hot Water Supply and Sludge Disposal." He showed that it might be possible to utilize sewerage works to illuminate and supply houses with hot water. As is well known, gas is generated in large quantities by the spontaneous decomposition of sludge. The sewerage works at Exeter were lighted for many years with gas from the septic tank. The Leper Hospital near Bombay pumps its sewage, lights its buildings and cooks its food by gas derived from the same source. The gas is due to the decomposition of cellulose by bacteria. It consists of methane (in largest quantity) carbon dioxid, hydrogen, nitrogen and oxygen. The problem of heating and lighting from this source is simply an economic one.

The Dental Condition of the Population

At the annual meeting of the British Dental Association, the president, Mr. George G. Champion, in his inaugural address said that the views of the association had at last received recognition by the government, which had laid down a skeleton organization for dealing with this urgent problem of national health and efficiency. It was now known, on the authority of a government committee's report, that one third of all the disease in the country was due, directly or indirectly, to dental disease. Among the general population, the condition of the teeth in women was worse than in men. In the western command of the army it was found that between 80 and 90 per cent. of the recruits needed dental treatment. To avoid the trouble which follows dental disease, it was essential to provide from earliest childhood for adequate inspection and treatment, including the practice of cleanliness, the use of a detergent diet, and early conservative dentistry. The state and local authorities had created a nucleus of an organization by arranging a dental service in 232 of the 1,870 maternity and child welfare centers. Other forms of dental service were those of school clinics, tuberculosis clinics, "additional benefit" under the Health Insurance Act, industrial dental clinics, and the naval and army dental services. But, even with the clinics privately organized by the large number of industrial firms, the national service was quite inadequate. The school clinics were staffed with dental officers only to the extent of one to more than 15,000 children, while for efficient work there should be one to every 5,000 children.

BELGIUM

(From Our Regular Correspondent)

Aug. 23, 1923.

The Belgian Surgical Society

The Belgian Surgical Society has held its regular general assembly at Brussels under the presidency of Professor de Beule of Ghent. The meeting was rendered of especial interest by the demonstration of operations by the surgeons of Brussels. Three main subjects were discussed:

ETIOLOGY OF PULMONARY EMBOLISM

Coryn presented a comprehensive paper demonstrating that all the phenomena of embolism originate from thrombophlebitis. Infarcts must be distinguished from true emboli. The statistical figures for infarcts are practically identical with those for thrombophlebitis in regard to the type of patients, their age, the interval since operation, the character of the disease, and the nature of the operation performed. One may conclude that the genesis of the infarct is identical with that of thrombophlebitis.

Similar correlations exist for emboli, but, on closer scrutiny, certain discrepancies appear. Embolism occurs, in the large majority of cases, in patients predisposed by cardiac or chronic vascular disease, is more frequent in men than in women, and occurs earlier than thrombophlebitis and especially after operations on the abdomen or pelvis: fibromyomas and cancer of the uterus (in which circulation is slow, and the veins are devoid of valves and have thin walls surrounded by loose cellular tissue). The origin of emboli may be attributed to the development of a thrombus due to a lesion of the vein wall, in a region in which the blood circulation is slow. This thrombus becomes detached, owing to the absence of organization. The pathogenesis of postoperative pulmonary complications is being attributed more and more to embolism.

SURGERY OF THE SYMPATHETIC NERVOUS SYSTEM

Lemoine gave a detailed report on the new and controversial problem of surgery of the sympathetic nervous system. He reviewed the various indications for section or resection of sympathetic nerve fibers, cervical, visceral, pelvic or periarterial. The results of sympathectomy in these various conditions are not constant, but the future of periarterial sympathectomy and surgery of the sympathetic nervous system in general is full of promise and seems to justify the hopes awakened by the importance and the extent of its applicability.

THERAPY OF CEREBRAL TUMORS

Referring to the studies of Cushing, Bremer discussed the difficult subject of cerebral tumors as revealed by the practice of the American surgeon. Bremer has confidence that the combined use of radiotherapy and surgery will bring better results.

Results of the Campaign Against Alcohol

In a comprehensive article published by the Office central d'études contre l'alcoolisme, Dr. Boulenger has pointed out the results of the laws at present in force in Belgium. There has been a 50 per cent. reduction in the consumption of alcoholic beverages since 1910. The per capita consumption is, however, still 2.5 liters. As an indirect result, a decrease in the number of cases of insanity due to alcohol is noted. In this connection, it is interesting to observe that 77.05 per cent. of the cases of syphilis are occasioned by alcoholism. There is also a close relation between alcoholism and criminality. The effects of this important legislation are readily apparent, for alcoholism has been reduced to a stage unknown in Belgium for more than forty years.

Clinic for Weakly Children

A clinic for the weakly infants and children of the less well-to-do has been opened in Brussels. It is operated under the direction of a society for anthropologic study. The clinical results already secured are worthy of interest, especially as they are accompanied by a detailed discussion of the biologic history of the child and a description of his present condition as determined by anthropometric indexes and clinical symptoms. The service is supplemented by the organization of eugenic inquiries in families that present particular medical interest. The model for the questionnaire adopted is that of the Office belge d'eugénique.

The Library of Louvain

The dedication of the first part of the library of Louvain, which was destroyed in 1914, has just taken place amid great festivities. The dignity of the occasion was heightened by the presence of the crown prince of Belgium, who deposited the first book on the shelves of the library. This volume was dedicated to the memory of the 196 students who gave their lives for the liberation of Belgium in 1914. Nicholas Murray Butler, president of Columbia University and chairman of

the American Committee for the restoration of the University of Louvain, presented an interesting volume containing the names of the children in the primary schools of New York who subscribed, a few months ago, the sum of $45,000 for the library of Louvain. France was also represented by the Comité français de l'œuvre de Louvain. The French minister of public instruction sent as a souvenir a collection of eighty fine photographs of the ruins of Reims cathedral.

Appointment

At a recent election, the Royal Academy of Medicine appointed as a foreign correspondent F. C. Waite, professor of histology and embryology in the Western Reserve University of Cleveland, Ohio.

BUCHAREST

(From Our Regular Correspondent)

Aug. 16, 1923.

Changes in the Roumanian Universities

The professorial board of the University of Cluj has introduced a regulation concerning the admission of new students to the medical school, under the terms of which they must pass a special entrance examination. The subjects included in this examination are: Roumanian language, history and geography; natural history; anthropology, and physiology. The examinations are both oral and written. Applicants are admitted to the university conditionally, final registration taking place only after the successful passing of the examination. Under the new statutes, Roumanian citizens must first be admitted to the universities, foreign students being received only when there are vacancies.

The length of the course has also been altered. Instead of the five years heretofore required, students must now attend for six years. In practice this will not lengthen the course, because the final year of practical instruction after graduation is canceled and is replaced by practical experience in clinics and hospitals during the summer vacation months. Professor Vasilin has also proposed that the lectures on descriptive and regional anatomy be restricted to one and one-half years instead of the two years heretofore required, and that students be examined in only one of these subjects. He argued that the present system of medical education is highly theoretical and lengthy. The first two years have been occupied almost entirely by anatomy. Several professors opposed this suggestion, but Vasilin's proposal was accepted with the modification that instead of dropping the fourth half year the study of biochemistry will be introduced.

Devastations by the Columbaci Fly

In almost all villages and towns in Oltenia County, the pastures have been attacked by huge swarms of the Columbaci fly, which have caused the death of more than 30,000 animals. In and around Calrafat, a town in the valley of the Danube, the flies have attacked men also, and many have succumbed to the bites. According to official reports, the Columbaci fly has never before attacked animals and men to such a degree, and it is feared that the flies may spread throughout the villages along the lower Danube. The Columbaci flies resemble the mosquitoes, gnats and tsetse flies; they are of ash-gray, and thickly haired. The first stage of their existence is passed in water, and they mature in May or June. The flies are about 2 or 3 mm. in length, and they swarm about animals (cows, oxen, pigs, goats) in enormous numbers and suck the blood. The infested animal is injured in three ways: rapid loss of blood, the pains of the innumerable stings, and the intoxication that follows the bites. Either of these is capable of causing the death of even the strongest animal. The minister of agriculture has given orders that the animals be taken out to pasture after dusk and driven to the stables before daybreak. In front of the stables smudge fires are to be made from wet twigs and manure. If for any reason the animals must be taken from the stables, the parts of the body devoid of hair are to be smeared with petroleum or tar. If the animals are pastured in the day, they should be driven near rivers with ample water, so that in case of infestation with flies, they can take refuge in the water. Treatment of animals or men attacked is palliative only; the termination is generally fatal, death ensuing in two or three days.

Abolition of the Death Penalty

The Roumanian chamber of deputies has discussed the question of death sentences. M. Cosma, minister of justice, argued that, in the interest of the safety of the state, it is imperative that the death penalty be retained. MM. Vailoiann and Yoanibescn opposed the death sentence. The ministerial board finally decided that the death penalty shall be stricken from the penal code.

Medical Congress in Bucharest

The medical officers of health of Roumania held a congress in Bucharest a few days ago. They discussed chiefly the condition of the hospitals, and agreed that at present the hospitals are disorganized, and their equipment is much behind the times. Dr. Buzenchi, chief medical officer, of Bucharest, said that there are many sanitary directorates and superintendencies in the country which cost a lot of money and are really sinecures. It would be wise to discontinue these and to erect new hospitals and equip the old ones with up-to-date installations. A similar opinion was expressed by Professor Marinescu, who proposed that the congress prepare a memorial to the government asking the abandonment of the sanitary superintendencies. Further, he demanded, decentralization of the sanitary institutions, hospitals and insurance offices (all of which are managed from a central office in Bucharest), the hospitals to be made autonomous. At present, if a hospital needs 50 kg. of cotton batting or an artificial leg, it must write to the central hospital superintendency at Bucharest for approval; if the answer is delayed, the man who has lost his leg must leave the hospital without an artificial limb.

BERLIN

(From Our Regular Correspondent)

Aug. 18, 1923.

Making of Surgical Motion Picture Films

A few months ago, I mentioned the use of motion picture films for recording and elucidating surgical operations for teaching purposes. A recent number of a technical journal gives a detailed description of the technic for making these films. Photographs taken with the style of apparatus used by the French surgeon Doyen twenty years ago would give only a perspective projection, in which the area of operation would constitute only a small portion of the field; the operator and his assistants would be unduly large by comparison. The picture also would give a diagonal view of the wound from a distance of from 3 to 4 meters, and would thus be so distorted that details could not be distinguished. Such distortions can be prevented only by placing the camera vertically above the wound. At first thought, it would seem that any kind of photographic apparatus could be used. However, certain complications arise. In order to magnify the operative field as much as possible, a lens of ordinary focal length must be used at close range, from 50 to 75 cm. The focusing of the objective and the correct position of the film carrier must be carefully regulated and maintained. It must be possible for the surgeon himself to make these adjustments

from below. The field of operation must be illuminated from above in a manner to eliminate shadows. Finally, the carriers must be large enough to contain sufficient film for half an hour's use. Technical arrangements also must be subordinate to the demands of surgical asepsis.

To meet these conditions, the lamps, the motors required for moving the camera, and part of the apparatus itself, which is of immense size as compared with the ordinary cinematograph, are placed on the floor above the operating room. Light from arc lamps, with suitable reflectors, is thrown from above vertically downward on to the operating table. In the glass ceiling a short sleeve about 25 cm. in diameter is inserted which serves as support for an iron rod about 5 meters long. This rod carries below the front of the cinematograph, and above two film boxes 50 cm. in length, and two steering motors. The rod within the sleeve can be raised and lowered and also turned about its longitudinal axis. The adjustable part of the apparatus is counterpoised, so that little power is required for raising and lowering, which are accomplished by means of a motor located on the floor above. A ball-bearing adjustment is employed to allow of rotation, power for the purpose being furnished by the second steering motor mentioned.

The necessary switches are arranged on a portable switchboard. Since either the surgeon or an assistant must operate the switches, all parts of the apparatus that may be touched by the surgeon must be susceptible of sterilization by boiling. The switch buttons are covered with a sterile cloth, and the buttons are adjusted by means of clamps placed over the cloth. The switch that controls the operation of the film is placed on the floor so that the machine can be started and stopped at will.

The head portion of the apparatus is spherical, and about 40 cm. in diameter. This contains the mechanism proper, including the finder and the objective, arranged about a horizontal axis. Focusing and adjustment of the field of the picture require special training. Both are of supreme importance, since the object to be photographed—the area of the operation—is close to the objective, and slight changes in distance will throw the picture seriously out of focus; slight changes in the field of the picture may also cause important deviations. Therefore, a method had to be devised to meet these difficulties. For this purpose the objective is mechanically connected with a long telescope. By focusing the eyepiece of this telescope, the objective and the film are automatically adjusted to correspond. The eyepiece is covered with sterilizable material.

The film as it runs between the carriers and the exposure chamber lies in a channel beside the long finding telescope. A series of rollers insures uninterrupted movement of the film.

Pictures of operations taken thus far, some of them of considerable length, furnish evidence that the apparatus works well. The illumination of the operative field is so distinct that the pictures, even when greatly magnified, are perfectly clear in all details. Also the perspective in the pictures is brought out unusually well. The important technical details, such as the motions of the knife, the suturing and the position of the various anatomic parts, are brought out distinctly. It is evident that, if the pictures are shown as ordinary lantern slides, important phases of the operation may be retained on the screen for detailed discussion; in this respect the motion picture has an advantage over actual observation of the operation.

In the Empress Frederick House, a few days ago, a Berlin urologist showed motion pictures of the human urinary bladder, and the movements of the bladder musculature were reproduced in a most interesting manner.

Marriages

ALLAN WILLIAM MULLIGAN, Grand Rapids, Mich., to Miss Eloise Carr of Beatrice, Neb., July 30.

WORTH BAGLEY DANIELS, Baltimore, to Miss Josephine January of St. Louis, September 3.

RUSSELL ROLLIN BEST to Miss Jane Nye Johnson, both of Omaha, at Cleveland, June 14.

ALICE GRACY, Jamaica, N. Y., to Mr. Alfred S. Giordan of South Bend, Ind., August 31.

MARK HOPKINS TIBBETTS to Miss Mary McGonagle, both of Duluth, Minn., in August.

FREDERICK DAVID COLEMAN, Ulysses, Neb., to Miss Lucia Wills of Lincoln, August 29.

SHERROD AUSTELL LINDSEY to Miss Irene Hammett, both of Fort Meade, Fla., July 18.

JOHN G. F. HOLSTON to Miss Jessie M. Richards, both of Zanesville, Ohio, July 11.

DAVID W. REGISTER to Miss Margaret H. Vignaux, both of Atlanta, Ga., August 25.

JEROME POWERS, Pittsburgh, to Miss Natalie Bergman of Detroit, recently.

Deaths

James Kelly Young ● Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1883; assistant demonstrator of surgery, 1886-1892, lecturer and associate professor of orthopedic surgery at his alma mater, and professor of orthopedics at the Graduate School of Medicine of the University of Pennsylvania at the time of his death; member of the American Orthopedic Association, the Philadelphia Academy of Surgery, the Philadelphia Pediatric Society, and the Philadelphia College of Physicians; on the staffs of the Women's Hospital and the Philadelphia Lying-In Charity Hospital; author of "Manual and Atlas of Orthopedic Surgery" and "Synopsis of Human Anatomy"; aged 61; died, August 28, at Beach Haven, N. J.

Seth Scott Bishop, Evanston, Ill.; Chicago Medical College, 1876; died suddenly, September 6, of heart disease; Dr. Bishop was formerly professor of otology, rhinology and laryngology at Loyola University School of Medicine, and the Post-Graduate Medical School, Chicago, and on the staffs of the Illinois Charitable Eye and Ear Infirmary, the Post-Graduate Hospital and Medical School, the Mary Thompson and Jefferson Park hospitals, Chicago, the Silver Cross Hospital, Joliet, and the Illinois Masonic Orphans' Home, La Grange. He was author of "Diseases of the Nose, Throat and Ear" and "The Ear and Its Diseases."

Charles Christian Manger ● Los Angeles; Medico-Chirurgical College of Philadelphia, 1906; member of the Philadelphia Psychiatric Society; formerly professor of neurology and psychiatry at the University of Southern California, Los Angeles, on the staff of California Lutheran Hospital, Los Angeles, and at one time superintendent of the Canyon Crest Sanitarium, Glendale; aged 52; died, August 21.

Charles David Schaeffer ● Allentown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1889; member of the American Roentgen Ray Society; formerly mayor of Allentown; for many years president of the board of health; on the staff of the Allentown Hospital; aged 58; died, September 2, of pericarditis.

Alexander Dwight Parce ● major, M. C., U. S. Army, Washington, D. C.; University and Bellevue Hospital Medical College, New York, 1903; on the staff of the Walter Reed General Hospital, where he died, August 21, aged 43.

Leonard Scofield E. Sugden, White Horse, Yukon; Cooper Medical College, San Francisco, 1888; for seventeen years surgeon to the Canadian Northwest Mounted Police; aged 60; was drowned, June 8, in the Stewart River.

Harry B. Innes, Pleasureville, Ky.; Hospital College of Medicine, Medical Department Central University of Kentucky, Louisville, 1892; died, August 28, of a self-inflicted bullet wound, while suffering from ill health.

Chester Byron Owens, Brodhead, Ky.; University of Louisville Medical Department, 1921; member of the Kentucky State Medical Association; aged 30; died, June 17, at St. Joseph's Hospital, Louisville, of septicemia.

John Patrick Davis ● New York; Medical Department of Columbia College, New York, 1885; aged 69; died, September 2, at the Franklin Square Hospital, Baltimore, following an operation on the gallbladder.

Charles Rich Butler, Brooklyn; Medical Department of the University of the City of New York, 1893; aged 53; died, August 29, at the Brooklyn Hospital, of chronic nephritis and cirrhosis of the liver.

Walter T. Bolton, Biloxi, Miss.; Louisville (Ky.) Medical College, 1884; formerly member of the board of health and city health officer; Spanish-American War veteran; aged 64; died, August 28.

Albert Andrew Scheller, Angelica, Wis.; Marquette University School of Medicine, Milwaukee, 1920; member of the State Medical Society of Wisconsin; aged 31; died, July 12, at Shawano.

Ira J. Cantrell, Springfield, Mo.; Washington University Medical School, St. Louis, 1906; member of the Missouri State Medical Association; aged 50; died, August 22, of uremia.

Robert Kantz Dodge, Fall River, Kan.; Missouri Medical College, St. Louis, 1887; member of the Kansas Medical Society; aged 59; died, August 27, of cerebral hemorrhage.

Thomas Martin Kelly, Philadelphia; Baltimore (Md.) University School of Medicine, 1904; served in the M. C., U. S. Navy, during the World War; aged 46; died, August 27.

Olline Burton Doyle ● Fresno, Calif.; Kentucky School of Medicine, Louisville, 1898; aged 47; died, August 28, at a local sanatorium, following an appendectomy.

Hunter Montgomery, Okemah, Okla.; Medical Department of the Tulane University of Louisiana, New Orleans, 1897; died suddenly, August 23, of heart disease.

Herbert Robertson Macaulay, Guelph, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1898; aged 61; died recently, following a long illness.

Josiah B. Martin, Plattsmouth, Neb.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1877; aged 77; died, August 21, of cerebral hemorrhage.

Forrest H. Phillips, Harlem, Ga.; University of Georgia Medical Department, Augusta, 1890; aged 57; died, August 23, following a long illness.

Julian Carr Hardy ● Lecompte, La.; Medical Department of the Tulane University of Louisiana, New Orleans, 1909; aged 35; died, August 12.

Walter D. Fischer ● Chicago; Rush Medical College, Chicago, 1904; aged 44; died, September 7, of acute bronchitis and chronic myocarditis.

Joseph Frederick Watson, Lamar, S. C.; Louisville (Ky.) Medical College, 1892; aged 71; died suddenly, August 20, of cerebral hemorrhage.

Arthur Dare Gary, Ringoes, N. J.; Jefferson Medical College of Philadelphia, 1912; aged 33; died, August 20, of cirrhosis of the liver.

Charles F. Williams, Anderson, Ind.; Medical College of Indiana, Indianapolis, 1882; aged 72; died, August 24, following a long illness.

Louis Haupt ● New York; Medical Department of the University of the City of New York, 1877; aged 72; died, September 2.

Ira A. Lee ● Erick, Okla.; Eclectic Medical University, Kansas City, Mo., 1905; aged 46; died, August 1, of angina pectoris.

Frederick W. Kohlhamer, Chicago; Missouri Medical College, St. Louis, 1890; aged 56; died, August 31, at La Mesa, Calif.

Henry B. B. Poppe, Milwaukee; Keokuk (Iowa) Medical College, 1891, aged 67; died, July 17, following a long illness.

Joseph Chase, Jr. ● East Weymouth, Mass.; Boston University School of Medicine, 1878; aged 73; died, August 23.

James Jackson Barnes, Benton, Tenn.; Chattanooga Medical College, 1899; aged 51; died, August 9, of acute enteritis.

Albert Lincoln Clarke, Brooklyn; Bellevue Hospital Medical College, New York, 1878; aged 70; died, August 29.

Charles Lewis Spangler, Louisville, Ky.; Eclectic Medical Institute, Cincinnati, 1872; aged 73; died recently.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

SOME MORE MISCELLANEOUS NOSTRUMS

Abstracts of Recent Notices of Judgment Issued by the Bureau of Chemistry of the United States Department of Agriculture

Cowan's Rheumatism Herb.—John J. Cowan of Santa Monica, Calif., who did business under the name of Rheumatism Herb Co., shipped a quantity of "Rheumatism Herbs" in November, 1920, from California to Colorado. The federal chemists reported that analysis showed the product to consist of the dried and moldy leaves of a species of eucalyptus. It was claimed on the trade package that the product was an effective treatment and cure for rheumatism and all kidney affections. These claims were declared false and fraudulent. In February, 1923, John J. Cowan pleaded guilty and was fined $11.—[*Notice of Judgment No. 11345; issued June, 1923.*]

Jad Salts.—The Wyeth Chemical Company of Detroit (which of course has no connection with the pharmaceutical house, John Wyeth and Brother of Philadelphia) shipped

between June and September, 1922, from Michigan to Wisconsin a quantity of a nostrum known as "Jad Salts." When analyzed by the Bureau of Chemistry, the product was found to consist essentially of citric and tartaric acids, salt, baking soda, sodium phosphate and very small amounts of hexamethylenamin, lithium carbonate and potassium bicarbonate. The stuff was falsely and fraudulently represented for kidney disease, rheumatism, headache, backache, etc. In December, 1922, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 11395; issued Aug. 10, 1923.*]

Crane's Quinine and Tar Compound, Crane's Liver Pills and Crane's Kidney Pills.—The Crane Medicine Company of Chicago shipped in October, 1919, and March and May of 1920, a quantity of "Crane's Liver Pills," "Crane's Kidney Pills" and "Crane's Quinine and Tar Compound," all of which were misbranded.

When the federal chemists analyzed the "Crane's Liver Pills" they reported that these consisted, essentially, of aloes and magnesium carbonate coated with sugar and chalk and colored orange. These tablets were falsely and fraudulently represented as an effective treatment, remedy and cure for headache, malaria, indigestion, etc.

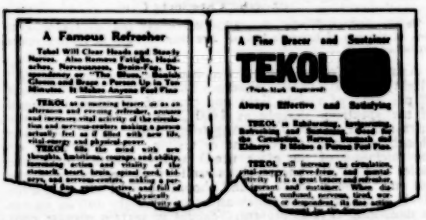
"Crane's Kidney Pills," when analyzed by the Bureau of Chemistry, were reported to contain methylene blue, hexamethylenamin, plant material and iron sulphate. They were

falsely and fraudulently represented as an effective treatment, remedy and cure for kidney disorders, inflammation of the bladder, backache, rheumatism, as a blood purifier, lumbago, Bright's disease, diabetes, enlarged prostate, gallstones, female weakness and several other things.

Analysis of a sample of "Crane's Quinine and Tar Compound" made by the Bureau of Chemistry showed that the product consisted, essentially, of quinin, sodium salicylate, ammonium chlorid, Epsom salt, oil of anise, tar, menthol, table salt, calcium phosphate, sugar, alcohol and water. The preparation was falsely and fraudulently represented as an effective treatment, remedy and cure for all pulmonary troubles, coughs, croup, whooping cough, asthma, difficult breathing and sore throat.

All three of the products were further misbranded in that they had a statement on the labels representing that the articles conformed to the Food and Drugs Act. In March, 1923, the Crane Medicine Company entered a plea of not guilty. The court, however, declared them guilty and fined them $200 and costs.—[*Notices of Judgment Nos. 11372 and 11373; issued Aug. 10, 1923.*]

Tekol.—Frederick J. Rief, who did business at Boston, Mass., under the trade name Colonial Tablet Co., shipped, in April, 1919, from Massachusetts to New Jersey a quantity of "Tekol," which was misbranded. When analyzed by the



federal chemists, Tekol was found to contain ground celery seed and cocoa with about half a grain of caffein in each tablet. Some of the claims made for Tekol were:

"Remember that Tekol is guaranteed to comply with all the requirements of the pure Food and Drug Law."

"Tekol is always Refreshing, Bracing and Sustaining. It will Increase Circulation of the Blood, Nerve Force and Vital-Energy, Clear Heads, Steady Nerves, Relieve Fatigue, Brain-Fag, Headache, Nervousness, Lassitude, Despondency or 'The Blues' and that Tired Feeling, in Ten Minutes making the average person Feel Fine."

These and similar claims were declared false and fradulent and in March, 1923, Frederick J. Rief entered a plea of *nolo contendere* neither admitting nor denying his guilt. He was fined $25.—[*Notice of Judgment No. 11360; issued Aug. 10, 1923.*]

Veronica Water.—The Veronica Medicinal Springs Water Company of Santa Barbara, Calif., shipped to Wisconsin in March, 1922, a quantity of Veronica Water, which the federal officials declared misbranded. Some claims made for this product were:

"As An Eliminant and Diuretic It Has No Equal."

". . . for the symptomatic relief of chronic nephritis."

"In many forms of liver, kidney, bladder and urethral troubles it is the desideratum, stimulating them to healthy action and assisting nature to throw off the waste products of the body. At the same time the powerful solvent properties of the alkaline salts is obtained and the hyper-acid condition of the blood neutralized."

"It would be necessary to take a review of the whole nosological index, if I was to occupy myself here with all the diseases which have been benefited or cured by the use of Veronica Mineral Water."

The Bureau of Chemistry reported that the analysis of Veronica Mineral Water showed it to contain magnesium sulphate (Epsom salt), sodium nitrate, sodium chlorid (common salt), calcium bicarbonate, calcium sulphate and magnesium chlorid. The government held that the claims made for this water were false and fraudulent, and in December, 1922, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 11336; issued June, 1923.*]

Correspondence

PRELIMINARY REPORT OF THE COMMITTEE FOR THE STUDY OF TOXIC EFFECTS OF LOCAL ANESTHETICS*

To the Editor:—The executive committee of this body, the General Committee for the Study of Toxic Effects of Local Anesthetics, wishes to announce that the individual members of this committee have presented reports to date of forty-two deaths following the use of local anesthetics occurring within the last three years, independent of those reported on by former committees of the Association. Few, if any, of these have been reported in the medical journals.

These reports have been sent to the chairman of the committee and have been tabulated by him for the study of the committee. Nineteen necropsies were made, and in most of them full protocols are in the possession of the committee and are being carefully studied preparatory to the full report. Minor changes may be made in the following list, but the main facts will remain. The deaths reported are:

Anesthetic	Number
Stovain	1
Alypin	1
Procain[1]	3
Apothesin	4
Butyn	4
Butyn and cocain	1
Procain[1] and cocain	10
Cocain	18
Total	42

1. Under this heading, novocain is included. One is reported as procain; the twelve others are stated to be due to novocain.

As the five deaths following the use of butyn are the first recorded, the committee is very desirous of receiving full details of other fatalities for comparison as to relative toxicity.

Any information received by the chairman from physicians will be considered as strictly confidential. This does not apply to official reports received from coroners, medical examiners or district attorneys procured at the expense of this committee.

EMIL MAYER, M.D., Chairman, New York.
40 East Forty-First Street.

REMOVAL OF ADHESIVE PLASTER

To the Editor:—Relative to detaching adhesive plaster from the skin with a minimum of discomfort to the patient: An adjunct is a liquid which dissolves rubber readily; is not inflammable; is free from noxious or explosive vapors; is not too volatile; does not unduly irritate the skin; is comparatively inexpensive, and is readily obtainable. Surgeons will find that carbon tetrachlorid possesses all of these desirable attributes, and one other which is rather undesirable, namely, a somewhat unpleasant odor which, fortunately, dissipates readily. If the odor is found to be objectionable, it may be mitigated by the addition of methyl salicylate or other inexpensive substances available among the essential oils.

The chemical should be obtainable as such in any drug store; but if, perchance, it is not available as carbon tetrachlorid, it may be bought, at a slightly increased price, under one of the many trade names by which a host of "safe cleaning fluids" is exploited nowadays.

If purchased under a trade name, care should be exercised to select a preparation that is guaranteed to be free from the

* The Committee for the Study of the Toxic Effects of Local Anesthetics (Dr. Emil Mayer, chairman) was appointed by the Therapeutic Research Committee of the Council on Pharmacy and Chemistry. The Therapeutic Research Committee and the Council have considered the preliminary report of Dr. Emil Mayer and have approved of its publication. W. A. PUCKNER, Secretary.

equally efficient but highly dangerous substances benzin or gasoline.

Carbon tetrachlorid has been used with success for this purpose by prominent Philadelphia surgeons for a number of years.

AMBROSE HUNSBERGER, Philadelphia.

To the Editor:—In THE JOURNAL, July 7, Dr. H. F. Zoller recommended the use of ethyl acetate for the removal of adhesive plaster. Since this is almost impossible to obtain, especially in the country drug stores, I want to suggest the use of ordinary benzene. If the adhesive strips are moistened lightly with the benzene by daubing it on with bits of cotton, the plaster will come away nicely; then the stains from the adhesive plaster are scrubbed off with the remainder of the benzene in cotton.

JOHN P. BRANDON, M.D., Essex, Mo.

To the Editor:—In THE JOURNAL, August 25, Dr. J. E. Stinson recommends a mixture of ether, alcohol, iodine and acetic acid for the removal of adhesive plaster. I have used gasoline for this purpose for more than nine years. It will loosen the plaster quickly if the plaster is wet with it generously, and any sticky material remaining can be very easily removed by rubbing gently with cotton wet with the gasoline. Gasoline is smooth to the touch, and I have never had any irritation from it.

LESTER R. MELLOR, M.D., Syracuse, N. Y.

DESTRUCTION OF LARVAE OF FLIES AND MYIASIS

To the Editor:—In the Spanish edition of THE JOURNAL, July 2, appears an abstract on the use of ethyl chorid for the destruction of larvae of flies that may exist in the nose, ears or other passages. In this connection, Dr. Filadelfo Masis, professor of the Salvador Faculty of Medicine, has for some time utilized insufflation of iodoform for the use of nasal myiasis. As this disease is found frequently in tropical countries, it might be advisable to call attention to this simple, economical and effective medicine.

AFILIO SALINAS, Usulutan, Salvador.

DEATH RATE OF NITROUS OXID

To the Editor:—I was greatly surprised to read in Queries and Minor Notes (THE JOURNAL, July 28, p. 320) that the "accepted" mortality rate from nitrous oxid is "about 1 death in 1,000,000 anesthesias."

In the *New York Medical Record*, July 29, 1916, I reported fourteen nitrous oxid deaths that had occurred in Columbus alone, with full details of each death. Gwathmey, in his review on anesthesia in the *New York Medical Journal*, Oct. 28 and Nov. 4, 1916, states that "gas should never be used alone, as it is unsafe for even *short* operations." The same writer in the *Annals of Surgery*, August, 1921, in writing of nitrous oxid-oxygen, states that the advocates of this anesthetic agent "are probably responsible for more deaths than are the advocates of any one anesthetic or single method."

Since the communication to the *Medical Record*, nitrous oxid-oxygen has been little used as a general anesthetic in Columbus, but I have records of six more deaths. A leading anesthetist of Chicago (Morgan) told me sometime ago that he did not think there was a general hospital in that city that had not had one or more deaths from nitrous oxid. Bevan (THE JOURNAL, Oct. 23, 1915) says that in prolonged anesthesia nitrous oxid is more dangerous than ether, and in nonexpert hands "much more dangerous than ether."

Henry Robinson, senior anesthetist to the Cancer Hospital, who has just brought out the fifth edition of Hewitt's book on anesthetics (1922), refers to "numerous fatalities" from nitrous oxid. Blomfield, senior anesthetist to St. George's Hospital, and lecturer on anesthetics to the Medical School, in his work on anesthetics (1923) says of nitrous oxid-oxygen: "Since its wide employment in surgery, many fatalities have been reported."

Judging from reports which I have received from physicians and surgeons from all over the country, I think it is safe to state that if all the deaths from nitrous oxid that have occurred in the last ten years were reported, the number would fall little short of one thousand, and I do not know of any anesthetist of large experience who does not agree with Gwathmey in his statement that in major surgery nitrous oxid-oxygen is the most dangerous anesthetic in use.

J. F. BALDWIN, M.D., Columbus, Ohio.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

CROOKE'S LENSES

To the Editor:—Kindly discuss the advantages and disadvantages, if any, of the use of Crooke's lenses. Are they of value in reading under artificial light?

J. F.

ANSWER.—Crooke's glass is manufactured in the "A" (light) and "B" (dark) shades. The A shade absorbs about 18 per cent. of visible light and cuts off the ultraviolet end of the spectrum sharply at 4,000 Angström units, and the infra-red at about 7,800 Angström units. The B shade absorbs well over 40 per cent. of visible light (depending on the thickness of the glass used) and eliminates the entire violet end of the spectrum as well as the majority of the red end. The B shade is and should be used almost exclusively in the trades in which an excess of light and an excess of damaging rays is present. Except in certain disease conditions, the B shade should not be considered for the routine use by an average person. On the other hand, the A shade has found great favor among persons who complain of the irritation of ordinary daylight or the usual artificial illumination. Possibly some slight relief follows the partial elimination of the ultraviolet rays from the line of direct vision, but undoubtedly the greatest relief is the psychic element. There is no advantage to be gained by the use of Crooke's A for routine use, provided the person has no pathologic change beyond an error of refraction. On the other hand, there is no disadvantage from the routine use of the glass beyond the fact that about twice as much light is absorbed by this glass as by ordinary crown glass.

DEATHS FROM NITROUS OXID ANESTHESIA

To the Editor:—In Queries and Minor Notes (THE JOURNAL, July 28, p. 320), in reply to a question as to the comparisons of dangers of different anesthesias, I note that you say the mortality rate from nitrous oxid is one in a million. I am wondering whether that is a mistake in print or is an established fact. Please let me know if these figures are from the reported cases or if it is a comparison based on an unestablished comparison.

C. E. PURCELL, M.D., Paducah, Ky.

ANSWER.—The reference to a death rate of one in a million under nitrous oxid anesthesia was probably drawn from the records of the Royal Dental Hospital of London, England. In this institution for many years all anesthesias, even for the simplest extractions, have been given by a staff of six or seven visiting physician anesthestists. So far almost one and a half million administrations of nitrous oxid and nitrous oxid-oxygen have been given in this way without a fatality. In America, one of the most noted series of nitrous oxid administrations is that of Thomas, a well known Philadelphia dentist (now retired), who gave nitrous oxid more than 250,000 times without a fatality. Quite a few dentists have records of from 50,000 to 75,000 administrations of nitrous oxid without a death. Since the advent of major oral surgery in the dental chair and the use of nitrous oxid-oxygen in major surgery, especially for hazardous risks, the death rate has materially increased, and in the opinion of various observers it ranges from 1 per cent. (Baldwin) to

one in 1,200 (Waters) to one in 50,000 or more (Gwathmey). Deaths from nitrous oxid-oxygen are reported occasionally, but not in proportion to the large number that occur. Possibly in the hands of the untrained anesthetist, nitrous oxid-oxygen is less safe than ether.

POISON IVY AND POISON OAK DERMATITIS

To the Editor:—What is the difference between a dermatitis caused by poison ivy and one caused by poison oak? Patients with a dermatitis venenata are often unable to tell how they contracted the disease otherwise than an outing to the country or the woods. Dr. Albert Strickler of Philadelphia has two specific toxins (antigens): one for poison ivy (rhus tox antigen) and another for poison oak (rhus venenata antigen). How is one to determine which specific antigen to use without a true history?

JOHN O'CONNELL, M.D., Overland, Mo.

ANSWER.—There is no clinical difference between the dermatitis caused by poison ivy and that caused by poison oak. McNair's textbook on Rhus Dermatitis, published by the University of Chicago Press, 1923, describes the differences between rhus dermatitis and dermatitis caused by other external irritants, but makes no distinction between the eruptions caused by the various types of rhus.

It would be necessary to test the patient's sensitiveness for poison ivy and poison oak to determine whether one or both antigens should be used, as described by Strickler.

COMBINING DIGITALIS AND QUININ

To the Editor:—I was much interested in the paper "Cinchona Derivatives in the Treatment of Heart Disorders," by K. F. Wenkebach (THE JOURNAL, August 11, p. 472). What is the best way to combine digitalis therapy with quinin for oral use?

SAMUEL GINSBURG, M.D., Buffalo.

ANSWER.—The capsule form, such as the following, may be recommended:

	Gm.
Powdered digitalis	1
Quinin sulphate	3

Mix and divide into fifteen capsules.
Label: One three times a day after meals.

If idiosyncrasy is suspected, it might be well to start with one-fourth as much quinin, later increasing the amount.

TREATMENT OF VITILIGO

To the Editor:—Kindly give references to recent articles concerning vitiligo, and also if possible give synopsis of latest accepted treatment. Please omit name.

——— California.

ANSWER.—There is no accepted treatment for vitiligo. Nothing has been discovered that does it any good. Treatment with thyroid gland extract is said to have proved useful in rare instances.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARIZONA: Phoenix, October 2-3. Sec., Dr. W. O. Sweek, 404 Heard Bldg., Phoenix.

CALIFORNIA: San Francisco, October 15-18. Sec., Dr. Charles B. Pinkham, 906 Forum Bldg., Sacramento.

FLORIDA: Tallahassee, October 9-10. Sec., Dr. W. M. Rowlett, Tampa.

GEORGIA: Atlanta, October 9-11. Sec., Dr. C. T. Nolan, Marietta.

IDAHO: Boise, October 2. Dir., Mr. Charles Laurenson, Boise.

ILLINOIS: Chicago, October 9-11. Supt. Mr. V. C. Michels, Springfield.

IOWA: Des Moines, September 25-27. Sec., Rodney P. Fagen, State House, Des Moines.

KANSAS: Topeka, October 9. Sec., Dr. Albert S. Ross, Sabetha.

MICHIGAN: Lansing, October 9. Sec., Dr. Beverly D. Harison, 707 Stroh Bldg., Detroit.

MINNESOTA: Minneapolis, October 2-4. Sec., Dr. Thomas S. McDavitt, 539 Lowry Bldg., St. Paul.

MONTANA: Helena, October 2. Sec., Dr. S. A. Cooney, 205 Power Bldg., Helena.

NEW JERSEY: Trenton, October 16-17. Sec., Dr. Alexander MacAlister, State House, Trenton.

NEW MEXICO: Santa Fe, October 8-9. Sec., Dr. W. T. Joyner, Roswell.

NEW YORK: New York, Albany, Syracuse, Buffalo, September 24. Sec., Dr. William D. Cutter, Albany.

PORTO RICO: San Juan, October 2. Sec., Dr. Jorge del Toro, 1 Olimpe St., San Juan.

Book Notices

LEISHMANIASIS Y BLASTOMICOSIS EN AMERICA. Por el Dr. Edmundo Escomel. Paper. Pp. 83, with 12 illustrations. Lima: Imp. Americana, 1923.

For a long time Escomel has ranked among the prominent students of tropical diseases. In this, his latest, contribution, he revises with his usual thoroughness the history, distribution, symptomatology, pathology, etiology, diagnosis, prognosis and treatment of two diseases, the importance of which has just begun to be realized in both North and South America. It seems, indeed, that South Americans were much slower than their northern colleagues in detecting these conditions, in spite of their endemicity and greater prevalence there. American readers interested in this subject may read profitably this little book, especially as regards geographic distribution, differential diagnosis and varied local names (uta, botón de Bahia, espundia, bubón de Vélez, forest yaws, úlcera de los chicleros) both of leishmaniasis and of blastomycosis in South America. The one criticism that might be offered Dr. Escomel's work is its apparent neglect of recent American and English literature. He is the greatest loser, however, as a perusal, especially of the Indian workers Brachamaria and Patton might have led him to modify his views, at least to some extent. Escomel, however, is fully convinced that the South American leishmaniasis is a separate entity, and American physicians might help to clear up the matter by comparing imported cases from the Old World and South America. The illustrations add little to the significance of the book, as most of them, except the photomicrographs, are very poor reproductions.

DIE LEHRE VOM TONUS UND DER BEWEGUNG. Zugleich Systematische Untersuchungen zur Klinik, Physiologie, Pathologie und Pathogenese der Paralysis Agitans. Von F. H. Lewy, Professor an der Universität Berlin. Paper. Price, $9.60. Pp. 673, with 577 illustrations. Berlin: Julius Springer, 1923.

This welcome monograph is a mine of authoritative information concerning most timely subjects, namely, paralysis agitans in particular, and disorders of tonus and motility in general. Especial attention is given to the histologic changes in paralysis agitans, but the whole subject of the pathology and pathogenesis of allied disorders of tonus and motility is considered. The underlying problems in physiology and chemistry are also discussed. Professor Lewy has devoted a lifetime to investigation of these subjects, and is the author of the chapter on the pathology of paralysis agitans in Lewandowsky's "Handbuch der Neurologie." The numerous colored illustrations add greatly to the attractiveness of this work, which should be carefully studied by all who are interested in neuropathology.

INFLAMMATION IN BONES AND JOINTS. By Leonard W. Ely, M.D., Associate Professor of Surgery, Stanford University. Cloth. Price, $6. P. 433, with 144 illustrations. Philadelphia: J. B. Lippincott Company, 1923.

It is Dr. Ely's thesis, supported by this book, that, in inflammation of bones and joints, only two of the osseous tissues are active: the marrow and the synovial membrane; that the ligaments, the cartilage, the bone tissue itself and probably the fibrous periosteum all take a purely passive part. This theory, as the author admits, is by no means generally accepted. In fact, by far the weight of opinion lies on the other side, most writers believing that the bone tissue itself is capable of active inflammation. The author considers the marrow, especially the lymphoid marrow, the constituent vulnerable to infection, and that its location determines the site of the localization of infection. In infancy practically all marrow is lymphoid; in childhood the lymphoid marrow gradually disappears from the shafts, and then slowly, with the lapse of years, from the ends of the bones also. The adult has little lymphoid marrow in his long bones. It persists longer in the bodies of the vertebrae. The marrow of spongy bone, at least well into adult life, and in children the marrow of the shafts also, is essentially a lymphoid tissue; and if pus germs of sufficient virulence are carried to the lymphoid marrow, it suppurates and breaks down just as

does a lymph node. The difference in the course of the two diseases, he believes, is in the amount of tissue involved and the fact that in osteomyelitis the process is shut up in an almost impermeable shell, making the process much more severe and increasing the danger immeasurably. This explanation of the frequency of the occurrence of infections of the bone marrow in the young is not the standard one, the accepted view being at present the one held by Lexer, who ascribes the causal rôle of the frequency of infections near the end of the bone to the arrangement of the blood vessels about the epiphyseal line. The marrow and synovial membrane are vulnerable to the same infectious changes; any bacteria that infect one can infect the other; however, certain infections show a preference for the marrow, certain infections for the synovial membrane, and certain others affect both tissues without preference. A knowledge of this fact helps us in our diagnosis. *Spirochaeta pallida* belongs in the first class, the gonococcus in the second, and the tubercle bacillus in the third.

The author points out also that the direction in which the various infections spread is a matter of interest and often an aid in diagnosis, tuberculosis always traveling toward the joint if it travels at all; pus infections usually traveling toward the shaft, less often toward the joint, but streptococcic infections showing a contrary tendency, traveling toward the joint. He states that there is probably no such thing as a primary disease of the articular cartilage, or invasion of it from the joint side; authorities differ on the last point, the majority holding the contrary opinion.

The discussion of acute osteomyelitis is disappointing. In considering the "typical, severe, spreading osteomyelitis," the author properly calls attention to the fact that the disease almost invariably begins in the metaphysis of one of the long bones. He states that inflammation spreads in the spongy bone, killing the marrow and the bone as it goes, and the process then adopts one of four different courses:

1. The typical, severe, spreading osteomyelitis, in which the inflammation prevails in the general direction of the central marrow canal, gains this and involves its marrow for a greater or smaller distance. It also passes through the minute canals in the cortex and comes to the under surface of the periosteum, lifting the periosteum from the cortex. The pus later breaks through the periosteum and finally makes its way to the surface. The author does not even mention the extremely interesting paper on acute hematogenous osteomyelitis by C. L. Starr (*Arch. Surg.* 6:567 [May] 1922). Starr points out that while the disease begins in the metaphysis, extension does not occur directly to the central medullary canal, as has been taught in the past, and presents evidence that the purulent material extends primarily to the surface beneath the periosteum, spreads shaftward, dissecting the periosteum from the cortex, and reaches the medullary canal only secondarily, after penetrating the cortex from without inward. The author states that redness and swelling, often edema, soon appear. Starr, on the other hand, emphasizes the fact that redness, swelling and edema should be looked on as relatively late manifestations, and that if the case is seen early it is bad surgery to wait for these findings. Starr points out that, in cases seen early, if the metaphysis is exposed over the point of localized tenderness and the periosteum is incised and no pus is yet present beneath it, proper surgery consists in merely making two or three drill holes into the metaphysis, being careful not to injure the epiphyseal cartilage and not to enter the medullary canal, which is probably not affected. Ely, on the contrary, says: "In no circumstances must fear of infecting the marrow cavity induce one to stop here. A long strip of cortex should be removed, the marrow canal should be inspected and if it be found infected, the removal of the lid of bone over it should be continued until the limits of the disease have been reached. It is not enough to open simply the central marrow canal." This surely would be considered bad teaching by many surgeons. Certainly many children's lives have been sacrified by such extensive surgical intervention in cases of hyperacute hematogenous osteomyelitis.

2. The superficial form in which the disease starts, as in the preceding form, and probably near the cortex, never reaches the central marrow canal, but, breaking through the thin cortex near the end of the bone, gains the under surface of the periosteum and spreads shaftward.

3. In the circumscribed form, the disease remains localized in the metaphysis.

4. In the articular form, the disease starts as in the preceding forms, but shows a marked tendency to spread toward the joint. It is caused usually by a streptococcus, less often by pneumococcus or typhoid bacillus.

In the consideration of treatment, the interesting experiences learned during the war concerning the treatment of tunneling osteomyelitis are not discussed or even mentioned. In treatment of acute suppurative hematogenous arthritis, Willem's treatment is not mentioned. The author does not discuss débridement in compound fractures, although he refers to it in Chapter 9, which deals with suppurative arthritis from wounds, and yet no mention is made that the procedure should be carried out within the first six hours.

A little more than one third of the book is devoted to the consideration of tuberculosis of the bones and joints. On page 216 the author states that "a positive diagnosis cannot be made by a clinical examination. . . . If, on the other hand, we admit our inability to arrive at a positive conclusion without the aid of the microscope, we are on the road to a correct handling of our cases." If our knowledge of tuberculosis were limited to the facts presented by the author, no one would disagree with his statements; but, fortunately, this is not the case. Most surgeons would not feel that they were "on the road to a correct handling of their cases" if they followed the author's suggestion of opening the joint and removing a piece of synovial membrane for guinea-pig inoculation, in case the joint contained no fluid that could be aspirated for guinea-pig inoculation. He states that "certainty can usually be secured by opening the joint and removing a piece of synovial membrane, making an emulsion and injecting a guinea-pig." Such a suggestion cannot be too strongly condemned. The author himself states, on page 222, that "no operation should be done to open up the diseased area."

LEGAL MEDICINE AND TOXICOLOGY. By Many Specialists. Edited by Frederick Peterson, M.D., LL.D., Manager Craig Colony for Epileptics; Walter S. Haines, A.M., M.D., and Ralph W. Webster, M.D., Ph.D., Assistant Professor of Medical Jurisprudence in Rush Medical College. Second edition. Two Volumes. Cloth. Price, $20 net, per set. Philadelphia: W. B. Saunders Company, 1923.

Twenty years' progress in legal medicine and toxicology are reflected in the increased size of these volumes, from 1,470 pages to 2,120 pages of text, and in new titles and changes in old ones. The chapter on "Insanity" has become a chapter on "Mental Disorders in Medicolegal Relations"; "Idiocy, Imbecility, and Feeble-Mindedness" is now the "Mental Defect Group"; "Ptomains and Other Bacterial Products in Their Relation to Toxicology" is "Poisonous Proteins"; "Food Poisoning" has expanded into "Food Poisoning and Food-Borne Infection," and "Malpractice" into the "Legal Rights and Obligations of Physicians." Among new titles we find "Forensic Questions Relative to Toxicology," "Industrial Poisonings," and "Poisonous Mushrooms." The brief reference to the Bertillon system of identification in the first edition is supplemented by a translation of Bertillon's paper on the "Identification of the Living," covering sixty-nine pages. The present importance of organic and inorganic arsenic compounds, methyl alcohol and carbon monoxid, and of the precipitin test for blood is recognized in the more ample space now assigned to them. "Summaries of the State Laws Relating to the Insane" covers about 10 per cent. of the text—an excessive amount, it would seem—but a search of the citations in this chapter shows only one later than 1917. The reader looks in vain, however, for any statement of the principles underlying such laws and for any discussion of the legal aspects of personal responsibility, civil and criminal, as correlated to the views of the advanced psychiatrist of the day. Some of the space devoted to the elaborate summary of these state laws, which relate to the restraint and custody of the insane, might with advantage have been given up to important topics now discussed scantily if at all: such as the regulation of the practice of the healing arts; quasipublic

functions of the physician, as the reporting of births, contagious diseases, deaths and crimes; the legal relations of hospitals and dispensaries; narcotic addiction and narcotic drug control; state and national prohibition laws, and the medical aspects of the workmen's compensation laws. Some of the contributors appear to have lost sight of the legal implications of the subjects they discuss. Some of the phraseology—as "mortuary nomenclature," "vulnerating force," "heterozygous status," and "toxicogenic"—is rather technical for a work intended for the use of lawyers as well as physicians; the technical terms, if unavoidable, should have been defined at the bottoms of the pages, or a glossary appended. The use of footnotes in all articles, as they have been so well used in some, showing sources of authority, would have aided materially to the value of the work. But, after all is said and done, this work is one that every expert and every lawyer will have to consult if he would be sure of his knowledge in any case involving medicolegal questions. It represents today the latest and most generally available work in the English language on the subject of which it treats.

LES GLANDES ENDOCRINES ET LEUR VALEUR FONCTIONNELLE. Méthodes d'exploration et de diagnostic. Par Jacques Parisot, Prof. agr., chargé du cours de Pathologie générale et expérimentale à la Faculté de Nancy, et Gabriel Richard, Ancien interne des Hôpitaux de Nancy. Paper. Price, 15 francs. Pp. 247, with illustrations. Paris: Gaston Doin, 1923.

The volume is one more in the avalanche of monographs on endocrinology, and by authors who appear to have done little real work in the field. The subject matter is organized in the conventional way. The exposition is lucid, but theoretical generalizations overshadow the critical analysis of facts. The authors do not show the extremes of credulity exhibited by many other writers in this field. But in Chapter IX, in which cases of alleged endocrinopathies are cited, diagnosis of such conditions as "hyperadrenalism" and combined "hypothyroid-hypopituitarism" are made on what appears to be very uncertain evidence. The references to the real endocrine literature is meager, especially the publications in English and in German. There is no index.

TRANSLATION OF SELECTED PASSAGES FROM DE L'AUSCULTATION MÉDIATE. (First Edition). By R. Théophile H. Laennec. With a Biography by Sir William Hale-White, K.B.E., M.D., Consulting Physician to Guy's Hospital. Medical Classic Series. Cloth. Price, $3.75. Pp. 193, with 8 illustrations. New York: William Wood & Co., 1923.

Twenty-five pages are devoted to an excellent life of Laënnec. This brief biographic sketch is more than a mere list of names and facts. It makes of Laënnec a living personality. His appearance, his surroundings, his character, his acts, his ideals are set forth with remarkable distinctness. The selections have been made with good judgment. The fact that we are dealing with a translation is forgotten, for the editor has not only caught the spirit of the French author but has rendered his words into clear, idiomatic, virile English that reads with natural ease and smoothness. Hale-White has performed a service of real value. He has made easily available to those who do not read French readily some of the best of the writings of the great pathologist and clinician who lived the life and wrote the book that had such a remarkable influence in shaping medical practice and thought of the last century. One is spared, also, the perusal of much that is relatively dull, for even Laënnec wrote some things that make dreary reading. Medical students might well be urged to consult the book. It is hard to get them interested in biography or medical history. This work, however, is one that might well attract them by its form and content, and thus interest them in the lives and writings of other leaders in medicine.

DER AUFBAU DER PSYCHOSE. Grundzüge der psychiatrischen Strukturanalyse. Von Dr. Karl Birnbaum, Privatdozent der Psychiatrie an der Universität Berlin. Paper. Price, 75 cents. Pp. 106. Berlin: Julius Springer, 1923.

This is an intricate essay in which the author attempts to set forth a "structural analysis" and synthesis of the various psychoses, and to show that psychiatry is more than a descriptive science. Psychiatrists with a philosophical turn of mind and capable of understanding complicated German will enjoy the book.

Medicolegal

Liability for Death of Insane Patient After Fall in Attempted Escape

(Bennett v. Punton Sanitarium Association (Mo.), 249 S. W. R. 666)

The Kansas City (Mo.) Court of Appeals, in reversing a judgment for $5,000 damages that was rendered in favor of the plaintiff for the alleged negligent killing of her husband, says that, at his request, he had been permitted to sleep on the fourth floor of the defendant's sanatorium, where there were only two or three other patients. The windows were covered with heavy wire screening, the wires being about the size of a lead pencil and fitted into iron frames which were bolted to the window casings with hinges and locked on the outside. Late one night an attendant found this patient on the ground below the bathroom window. The patient said that he had got a key and opened the lock of the window, but the evidence showed that no key was missing. Out of sheets he had made an improvised rope which reached to within about 12 or 14 feet of the ground, but evidently did not put his weight on the sheets, as the knots were not pulled tight. The result was a fall on a cement walk and an iron cap connecting the sewer pipe, whereby he sustained a dislocation of the third and fourth lumbar vertebrae of his spine, and became paralyzed in the lower extremities. His death occurred about two years and three months thereafter.

The superintendent and another physician employed by the defendant, who were called as witnesses by the plaintiff, said that the patient was perfectly rational at the time he attempted to escape. Of course, in order for the plaintiff to recover in this action, it was necessary for her to show that the patient was insane when he attempted to escape, that he escaped by reason of his insanity, and that the defendant had knowledge of his insane condition. But she was not conclusively bound by the testimony of these witnesses, although she had placed them on the stand.

The evidence showed an unbalanced mental condition of the patient prior to his entry into the sanatorium, and showed that while in the sanatorium he had manifested peculiar traits indicating an abnormal condition of mind. The mere fact that he attempted to escape might not alone be strong evidence of his insanity, for many perfectly sound-minded persons who have been deprived of their liberty by confinement have attempted to escape. But the manner in which he attempted to escape, in making a rope with knots that would not hold, and extending only to within 14 feet of the ground and over a cement sidewalk, and then going down the rope without making an effort to break his fall by using the rope to any extent or putting much weight on it, together with the other facts, tended to show an unbalanced condition of mind at the time. Moreover, another physician testified that the patient was insane a few days before the attempted escape, and on the day following. These facts, together with the fact that the patient was confined on account of his insanity, and that he was undergoing periods of irrationality which came on suddenly during the time of his confinement until shortly before his attempted escape, were certainly sufficient evidence for the jury to say that he was insane at the time of his escape, although the defendant's physicians testified that he was not.

It was insisted that the case involved the proper care and treatment of an insane person by a physician, and that the plaintiff failed to introduce any evidence tending to show that the patient was not given the usual care and attention given to such patients by ordinary institutions of similar character. But the court does not think it was necessary to produce expert testimony on this subject. It was competent for the jury as laymen to judge of the patient's insanity from the facts, and, having found that the patient was insane and that the defendant knew or might have known that he would attempt to escape, it was for the jury to say what would constitute ordinary care on the part of the defendant in taking precaution to prevent him from escaping during an irrational period, which the evidence showed came on suddenly. It was

the duty of the defendant, as a matter of law, to safeguard the patient from danger due to his mental incapacity to care for himself.

However, the court finds it necessary to reverse and remand the case on account of the asking of an improper hypothetic medical question, in that it did not contain all the pertinent history of the patient prior to the fall and the medical history after it, whereas the patient suffered from a complication of disorders both before and after his injury.

Not Required to Pay Injured Employee's Physician

(Whitehead Coal Mining Co. et al. v. State Industrial Commission et al. (Okla.), 213 Pac. R. 838)

The Supreme Court of Oklahoma says that this action was instituted by the petitioners to have an award of $253 made by the industrial commission to a physician for compensation for medical services vacated. The commission made no specific finding as to who employed the physician. The substance of the findings of the commission was that another physician discontinued treatment before the injured employee had recovered, and that it was necessary for the latter to have further treatment, and he was treated at various times until May, 1921, by the physician in whose favor this award was made; also that the petitioners had failed to furnish the injured employee necessary medical attention, although they knew that the physician whom they had furnished had discontinued treatments, Aug. 1, 1919; that the physician who was awarded this compensation attended the man in connection with the treatment that was given by the first physician between July 1 and Aug. 1, 1919, and that the total amount of his bill was $253, which was reasonable. It was clear from the record that the second physician was employed by the injured man's family and not by the petitioners; that they furnished the first physician to treat the injured employee during the first fifteen days following the injury, at which time he discharged the patient, and that no request was ever made by the injured employee or by any one for him to the employer mining company for medical treatment. This presented a case in which the injured employee, through some member of his family, employed the physician, without having made any request to the employer for medical treatment, and the employer furnished another physician immediately following the injury, and no complaint was made that the physician so furnished was unskilful or did not furnish proper treatment. Under such circumstances, it could not be said that the second physician was called under emergency caused by the employer's failure to provide medical aid. In these circumstances, it seems clear to the court that the industrial commission committed error as a matter of law, in making the award complained of. The court knows of no provision of the workmen's compensation act of Oklahoma whereby the employee may employ a physician at the expense of the employer, except in a case in which he has requested the employer to furnish medical attention, and the employer has failed or refused to do so. Wherefore the award in this case is reversed.

"Osteopathy" and "Manipulation" Do Not Cover Surgery

(State v. Sawyer (Idaho), 214 Pac. R. 222)

The Supreme Court of Idaho, in affirming a judgment of conviction of the defendant of practicing medicine and surgery without a license, with the intent of receiving compensation therefor, says that the operation performed consisted of making an incision into the abdomen of a human being and removing the appendix. It was shown that the defendant did not have a license authorizing him to practice medicine and surgery, but held a license authorizing him to practice osteopathy. In 1907, the legislature passed an act regulating the practice of osteopathy, which provides that a successful applicant shall receive "a certificate granting him or her the right to practice osteopathy in the state of Idaho." Unless, therefore, the term "osteopathy" is broad enough to comprehend surgery, or in other words, unless the practice of osteopathy includes the practice of surgery, the statutory prohibition of the practice of medicine and surgery, except by one who has obtained the license to practice medicine and surgery as prescribed by Chapter 90 of Title 16 of the Compiled Statutes, still prevails.

"Osteopathy," the court feels justified in concluding, from various definitions, is a system of treating diseases of the human body without drugs and by means of manipulation. The word "manipulation" certainly does not cover and include the practice of surgery in any form. Since, therefore, the term "osteopathy" does not include medicine and surgery within its content, the court concludes that it was the legislative intent that a license to practice osteopathy does not carry with it the right to practice medicine and surgery, or either of them.

The defendant sought to show that the standard and accredited colleges of osteopathy include medicine and surgery as a part of their curriculums; that the science or practice of osteopathy contemplates and comprehends the practice of medicine and surgery; that the colleges of osteopathy use the same textbooks on the practice of medicine and surgery that are used in the best recognized medical schools, and devote as much time to the subject as is consumed in the best medical colleges in this country. The trial court refused to receive such evidence. In this it did not err. The evident purpose of the proposed testimony was to show that graduates of recognized and accredited colleges of osteopathy now possess the requisite knowledge and skill to engage in the practice of medicine and surgery; but the only question here was as to whether the defendant possessed the statutory qualifications—his actual qualifications were not in issue. The evidence was therefore irrelevant.

"Sound Health," "Deformity" and "Infirmity"

(Eastern Dist. Piece Dye Works, Inc., v. Travelers' Ins. Co. (N. Y.), 138 N. E. R. 401)

The Court of Appeals of New York says that a Mrs. Klein, in her application for insurance on her life payable to the plaintiff, stated that she was in sound condition mentally and physically, and had "never had any bodily or mental infirmity or deformity." It appeared, however, that about thirty years previously, she had received in childbirth a laceration of the perineum or related parts, but that it had never interfered with her general health. Yet, six months after she made the foregoing statements, she went to a hospital to have an operation performed for this laceration. When the operation was undertaken, the surgeon discovered some tissue which was thought to be cancerous, and also an abnormal intestinal or rectal formation, which led him to perform a major operation that resulted in the death of the patient, whereas it subsequently appeared that the suggestion of cancerous tissue was entirely unfounded, and that the abnormal formation, which had existed from birth, did not in any manner interfere with the normal operation of the parts in question, and was in all probability unknown to Mrs. Klein. Under these conditions a jury clearly could say that she was in sound health.

The evidence of the abnormal condition of her intestinal or rectal organs did not satisfy the requirement for fraud in a warranty, because of the apparent lack of knowledge on her part of the existence of any such condition as was found. On the whole, it was also doubtful whether she had any such knowledge of the laceration as would make her guilty of falsehood and fraudulent intent when she stated that she had no physical deformity or infirmity. Such words as "deformity" and "infirmity" in such a connection must have a reasonable interpretation, and, assuming that they cover such a condition as an accidental laceration from which Mrs. Klein suffered, they should not be construed as so covering a defective condition of insignificant extent and of no practical effect on the bodily condition of an insurance subject as to make a denial of their existence conclusive evidence of fraud. Therefore, the court thinks that a jury might say that Mrs. Klein was not guilty of any intentional falsification or fraudulent intent in stating, as against this laceration, that she had no physical deformity or infirmity, and it was an error to hold otherwise as matter of law and to dismiss the complaint as was done.

So far as concerned the laceration, that was not a "deformity," but, if anything, an "infirmity." One who cuts his finger does not, under a reasonable interpretation of language, pro-

duce a deformity which implies some sort of a malformation. On the other hand, the difficulty with the applicant's intestinal or rectal organs was apparently a deformity. But, assuming that the applicant under the broadest possible meaning of those words in one case had an infirmity and in the other a deformity, the question still remained whether these defects were of sufficient extent and importance so that within a reasonable meaning of the words a statement by the applicant that she was free from deformities and infirmities constituted a material misrepresentation which avoided the policy; this, the court thinks was a question for the jury. No person is entirely free from deformities and infirmities. In the broadest interpretation of this language, a crooked nose would be a deformity, and the slightest impairment of full bodily vigor an infirmity. But, of course, the language of a representation contained in an application for insurance is not to be construed in any such unreasonable way as this. It must be construed as meaning a deformity or an infirmity of a substantial character which apparently in some material degree impairs the physical condition and health of the applicant and increases the chance of that death or sickness against which the insurance company is asked to issue insurance, and which, if known, would have been liable to deter the insurance company from issuing the policy. Applying this interpretation to the language used, the court thinks that the jury could have said that the existence of the defects referred to did not render the applicant's statement a material misrepresentation.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Washington, D. C., Oct. 15-20. Dr. Luther C. Peter, 1529 Spruce St., Philadelphia, Secretary.

American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, Philadelphia, Sept. 19-21. Dr. James E. Davis, 111 Josephine Avenue, Detroit, Secretary.

American Association of Railway Surgeons, Chicago, Oct. 18-20. Dr. L. J. Mitchell, 29 E. Madison St., Chicago, Secretary.

American Child Health Association, Detroit, Oct. 15-17. Dr. Philip Van Ingen, 125 East 71st St., New York, Secretary.

American Electrotherapeutic Association, Atlantic City, Sept. 18-21. Dr. Richard Kovacs, 223 E. 60th Street, New York, Secretary.

American Public Health Association, Boston, Oct. 8-11. Mr. A. W. Hedrich, 370 Seventh Avenue, New York, Secretary.

American Roentgen Ray Society, Chicago, Sept. 18-23. Dr. W. W. Watkins, Goodrich Building, Phoenix, Ariz., Secretary.

Association of Military Surgeons of the United States, Carlisle Barracks, Pa., Oct. 4-6. Col. James Robb Church, Army Medical Museum, Washington, D. C., Secretary.

Central States Pediatric Society, Detroit, Oct. 18-19. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Pa., Secretary.

Delaware State Medical Society, Middletown, Oct. 8-9. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Indiana State Medical Association, Terre Haute, Sept. 26-28. Dr. Charles N. Combs, Terre Haute, Secretary.

Interstate Society of Radiology and Physiotherapy, Omaha, Sept. 18-19. Dr. Roland G. Breuer, Security Mutual Life Building, Lincoln, Neb., Secretary.

Kentucky State Medical Association, Crab Orchard, Sept. 17-20. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Medical Association of the Southwest, Kansas City, Mo., Oct. 4-8. Dr. E. H. Skinner, Rialto Building, Kansas City, Mo., Secretary.

Minnesota State Medical Association, St. Paul, Oct. 10-12. Dr. Carl B. Drake, Guardian Life Building, St. Paul, Secretary.

Mississippi Valley Medical Association, Hot Springs, Ark., Oct. 9-11. Dr. John L. Tierney, University Club Bldg., St. Louis, Secretary.

Missouri Valley, Medical Society of the, Omaha, Sept. 20-21. Dr. Charles W. Fassett, 115 East 31st Street, Kansas City, Secretary.

Nevada State Medical Association, Reno, Sept. 28-30. Dr. Horace J. Brown, Thoma-Bigelow Building, Reno, Secretary.

New England Surgical Society, Boston, Oct. 18-19. Dr. P. E. Truesdale, 151 Rock Street, Fall River, Mass., Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 1-4. Dr. W. F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Tri-State District Medical Society, Des Moines, Iowa, Oct. 29-Nov. 1. Dr. William B. Peck, 82 Stephenson Street, Freeport, Ill., Managing Director.

Vermont State Medical Society, Bennington, Oct. 11-12. Dr. W. G. Ricker, St. Johnsbury, Secretary.

Virginia, Medical Society of, Roanoke, Oct. 16-19. Mr. G. H. Winfrey, 104½ W. Grace St., Richmond, Secretary.

Washington State Medical Association, Spokane, Sept. 20-22. Dr. C. H. Thomson, 508 Cobb Bldg., Seattle, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Oct. 3-5. Mr. J. G. Crownhart, 558 Jefferson St., Milwaukee, Secretary.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

166: 1-156 (July) 1923

*Retained Gallbladder. Difficulties and Disadvantages of Secondary Cholecystectomy. DeW. Stetten, New York.—p. 1.

Associated Pneumonia and Appendicitis at Same Time. S. R. Roberts, Atlanta, Ga.—p. 31.

Primary Lymphoblastoma of Stomach with Metastases. S. Ruffin, Washington, D. C.—p. 37.

*Nonspecific Granuloma of Intestine. E. Moschcowitz and A. O. Wilensky, New York.—p. 48.

Rôle of Spasticity in Diseases of Digestive Tract: Case of Visceral Tetany, Causing Acute Cholangitis and Pancreatitis. J. Kaufmann, New York.—p. 67.

*Chemistry of Pseudochylous Ascites and Other Types of Exudates. R. B. Gibson and C. P. Howard, Iowa City, Ia.—p. 80.

*Cardiovascular Complications of Kyphoscoliosis; Case of Paroxysmal Auricular Fibrillation in Patient with Severe Scoliosis. E. P. Boas, New York.—p. 89.

*Absorption from Urinary Bladder. F. C. Mann and J. A. H. Magoun, Rochester, Minn.—p. 96.

*Method of Establishing Diabetic Patients on High Calory Diets with Ketogenic-Antiketogenic Ratio within Limits of Safety. F. A. Evans, Pittsburgh.—p. 106.

*Medical Treatment of Gastroduodenal Ulcer; Use of Rice-Water Mixture. T. G. Schnabel, Philadelphia.—p. 114.

Stability of Epinephrin Hydrochlorid in Various Solutions. D. Vander-Hoof and C. C. Haskell, Richmond, Va.—p. 119.

Cholecystectomy for Retained Gallbladder.—On the basis that the retained gallbladder, at least one that has been drained, is a menace to health, even to life, Stetten urges that a primary cholecystectomy should be performed, if this is at all possible, irrespective of the degree of structural change in the gallbladder itself. If, for any reason, either on account of the general condition of the patient or because of local difficulties, primary cholecystectomy cannot be performed and only cholecystostomy is done, this should be looked on as an emergency procedure. A secondary cholecystectomy should be practiced when the patient's condition has improved, unless there are specific contraindications. The one only exception to this rule is irremediable occlusion of the common duct, such as carcinoma of the head of the pancreas or impermeable stricture. Here the gallbladder must be retained for anastomosis with some part of the gastro-intestinal tract. In chronic pancreatitis with jaundice, cholecystostomy should first be performed, and after the fistula has closed without symptoms, so that the patency of the common duct is assured, secondary cholecystectomy should be undertaken. In chronic pancreatitis without jaundice, primary cholecystectomy is the operation indicated. In certain cases of so-called "silent" gallstones, accidentally discovered during the course of a laparotomy for some other condition, when the gallbladder is found to be comparatively normal, Stetten has on several occasions practiced "ideal cholecystotomy" closing the abdomen without drainage. This is, at times, a useful, alternate, method, conserves the more or less healthy gallbladder and obviates the disadvantage of cholecystostomy. Stetten has never seen any harm come from the absence of the gallbladder.

Granuloma of Intestine.—Four cases of nonspecific granuloma of the intestine are described by Moschcowitz. All involved the colon; one involved both colon and small intestine. The histologic characteristics were those of a simple granuloma. No evidences of tuberculosis, syphilis or lymphogranulomatosis were present. The granuloma may involve any portion of the colon. The infiltration of the wall may be more prominent on the mucosal or the mesenteric aspect. In both instances, the lumen is narrowed. Ulcerations, which are usually superficial, many be present; exceptionally, an abscess will form. The cause most often is unknown. In a few cases foreign bodies and colitis have been reported. Clinically, these cases present signs of constriction of the intestinal lumen and a mass in some portion of the colon. Thus far, they are not diagnosable before operation and have usually been mistaken for carcinoma and tuberculosis of the

intestine. Not infrequently these tumors disappear after simple sidetracking of the intestine. The prognosis is excellent.

Chemistry of Pseudochylous Ascites.—The chemical composition of a milky peritoneal fluid from a case of malignancy, and the comparative data of three cases with serous ascites are presented by Gibson and Howard. The milky effusion was characterized by its high content of lecithinphosphoric acid and to a lesser degree of cholesterol. Net fatty acid figures were low for all the fluids. Calcium in protein combination is not responsible for the opacity of the fluid. Milky fluid obtained at necropsy one hour after death following three days of anuria has a nonprotein nitrogen partition such as is found for the blood in severe retention cases. It is concluded that the milky fluid obtained in the authors' case was a true pseudochylous ascites.

Cardiovascular Complications of Kyphoscoliosis.—Attention is called by Boas to the frequent visceral disturbances that accompany severe kyphoscoliosis. Hypertrophy and dilatation of the right chambers of the heart, followed by signs and symptoms of myocardial insufficiency are common sequelae. A case is described with paroxysmal auricular fibrillation and symptoms of myocardial insufficiency.

Absorption from Urinary Bladder.—Experiments made by Mann and Magoun definitely prove that absorption takes place from the urinary bladder, but only to a very limited extent.

Diabetic Dietary.—A conception of the diabetic dietary based primarily on the caloric, rather than principally on the glucose tolerance of the patient, is presented by Evans and a simple formula for the necessary computations is derived. This method of procedure is helpful because it enables one to study diabetic patients without first establishing the glucose tolerance, which is so difficult to determine accurately. The early results obtained by this method of feeding diabetic patients have so far been extremely gratifying.

Rice Water Mixture in Gastroduodenal Ulcer.—Schnabel reports good results from the use of this mixture in the treatment of gastric and duodenal ulcers: One-half cup of rice is boiled in five cups of slightly salted water until soft. One quart of the water is strained off and cooled. Four tablespoonfuls of lactose, the whites of four eggs, slightly beaten, and one-half cup of cream are then added. The mixture is kept in a cool place. The palatability of the rice-water mixture may be influenced by the addition of peppermint, chocolate, nutmeg or coffee. It is a difficult matter accurately to determine the caloric value of this mixture, but it is quite likely that a quart will yield at least 750 calories. From two to 6 ounce portions of this preparation are usually taken at hourly intervals for thirteen feedings per day. After the symptoms are allayed for twenty-four hours at least, the caloric value of the rice-water mixture is increased by adding more cream, sugar or whites of eggs. Very quickly after this the patient goes on to either a partial or entire milk and cream mixture, and, if well tolerated, passes on to a soft or light diet, usually preponderantly carbohydrate.

Archives of Dermatology and Syphilology, Chicago

8: 165-324 (Aug.) 1923

*Syphilis of Orbit. J. E. Kemp, Baltimore.—p. 165.
Importance of Blood Chemistry in Dermatology. Edwin Pulay, Vienna. —p. 175.
*Kahn Precipitation Test in Leprosy. E. M. Yagle, J. A. Kolmer, Philadelphia.—p. 183.
Lymphangiomatous and Hemangiomatous Nevus Associated with Enormous Hypertrophy of Sweat Glands and Localized Hyperhidrosis on Excitement. J. H. Stokes, Rochester, Minn.—p. 186.
Prurigo Nodularis. E. W. Netherton, St. Louis.—p. 193.
*Etiology of Pemphigus. F. Eberson, Rochester, Minn.—p. 204.

Syphilis of Orbit.—The similarity of the clinical picture in the four cases cited by Kemp was striking. The patients acquired syphilis some years previously. The duration of symptoms referable to the eye ranged from six months to three weeks, in two cases the onset being comparatively acute. The complaint was uniformly unilateral pain, referred to the affected eye, and worse at night. In each instance there was unilateral exophthalmos together with some degree of paralysis of the extra-ocular muscles, ranging from weakness of a single muscle to complete ophthalmoplegia externa. Three of the four patients showed a more or less complete ptosis of the upper lid, and in each instance the pupillary reactions were abnormal on the affected side. There was usually pain on pressure over the bulb. In three cases, there was complete anesthesia in the distribution of the first branch of the trigeminal nerve. In three cases, there was a marked decrease in vision on the affected side, in one instance accounted for ophthalmoscopically by the presence of unilateral choked disk, in the others probably due to pressure on the optic nerve.

Kahn Precipitation Test in Leprosy.—The serums of twenty-eight lepers were examined by Yagle and Kolmer by the Kahn precipitation test for syphilis. Of this series, twenty-three cases showed no evidences of syphilis; the Kahn reactions were negative in all except two, and the new complement fixation reaction was negative in all. In two cases of leprosy lesions suspicious of syphilis, the Kahn reaction was ± in one and the complement fixation reactions were negative. Three cases showed unmistakable evidences of syphilis in addition to leprosy; the Kahn and complement fixation reactions were strongly positive in all.

Etiology of Pemphigus.—An organism has been isolated by Eberson from the blood of seven patients, five with undoubted, and two with probable, chronic pemphigus. The organism was obtained repeatedly in every case, and was morphologically, culturally and immunologically the same. It is gram-positive, anaerobic, nonmotile, ovoid or coccoid in form, resembling a streptobacillus in certain respects, is pathogenic for guinea-pigs and rabbits, and possesses definite toxic properties. The bacterium has not been found in normal persons, or in those having certain other skin diseases. Suggestive lesions have been produced with recently isolated strains of the organism, and a definite clinical picture has been experimentally demonstrated. It has been reisolated from the blood of infected animals. Cultures have been obtained from patients, both early and late in the disease and in intervening stages, and have been agglutinated by patients' serums. Clinical and experimental data have been presented and analyzed, and the characters of the organism described as far as the work has gone. The organism has been named provisionally *Bacterium pemphigi*.

Archives of Internal Medicine, Chicago

32:1-156 (July) 1923

*Metabolic Studies in Pernicious Anemia. R. B. Gibson and C. P. Howard, Iowa City.—p. 1.
*Blood Pressures in Fifteen Thousand University Freshmen. W. C. Alvarez, San Francisco.—p. 17.
Blood Concentration Changes in Extensive Superficial Burns, and Their Significance for Systemic Treatment. F. P. Underhill, New Haven, Conn.—p. 31.
*Observations on One Hundred and Ninety-Two Consecutive Days of Basal Metabolism, Food Intake, Pulse and Body Weight in a Patient with Exophthalmic Goiter. C. C. Sturgis, Boston.—p. 50.
Effect of Alkalies on Secretion and Motility as Measured by Fractional Gastric Analysis. B. C. Lockwood and H. G. Chamberlain, Detroit. —p. 74.
*Acute Lymphadenosis Compared with Acute Lymphatic Leukemia. H. Downey and C. A. McKinlay, Minneapolis.—p. 82.
*Three Fatal Adult Cases of Malabsorption of Fat, H. L. Blumgart, Boston.—p. 113.
*Chylous and Pseudochylous Effusions. M. A. Blankenhorn, Cleveland. —p. 129.
Causes of Turbidity in Milky Ascitic Fluids. M. A. Blankenhorn, Cleveland.—p. 140.

Metabolic Studies in Pernicious Anemia.—Eleven cases of pernicious anemia, and for comparative data, one case each of an aplastic anemia, pregnancy anemia, hemolytic icterus and splenic anemia, have been studied by Gibson and Howard. Low whole blood and plasma fats were found in the severe pernicious anemia cases and tended to increase with improvement in the blood picture for the individual cases. The low blood fats seem to be associated with higher iodin numbers (by a micro-adaptation of the Hanus method), though the amounts of the unsaturated fatty acid groups as evidenced by the total iodin absorbed are not excessive. An increased unsaturated fatty acid content, therefore, should not be a factor for hemolysis in pernicious anemia. That blood and plasma cholesterol figures are low in pernicious anemia cases and increase as the blood is regenerated is confirmed. Low figures were found also for one splenic anemia case. More

favorable nitrogen and especially iron balances may readily be established in pernicious anemia and some other anemias (excepting iron in one case of splenic anemia) when diets rich in food iron (Whipple) and comparatively low in calory and protein values are given. Negative nitrogen balances and coincident iron retention may obtain. Characteristic but not constant alterations in the nitrogen partition in pernicious anemia are low urea and moderate ammonia nitrogens, and high uric acid figures. The immediate effects of blood transfusions on the daily nitrogen partition (two cases) were an increase in the total, urea, uric acid, and creatinin nitrogen elimination, persisting over at least two days. The use of iron-rich and vitamin adequate diets in the anemias is urged, but established therapeutic measures to promote hematogenesis should not be neglected.

Blood Pressure Study.—An analysis was made by Alvarez of the systolic blood pressures of 6,000 men and 8,934 women freshmen entering the University of California. The pressures of the women were more uniform than those of the men, and averaged 11 mm. lower. Hypertension was very common among the younger men, about 45 per cent. having pressures exceeding 130, and 22 per cent. having pressures exceeding 140 mm. Among the women, about 12 per cent. had pressures exceeding 130, and about 2 per cent. had pressures exceeding 140 mm. The average pressure for both men and women drops gradually during the first years of adult life. The pressures for the men are grouped mainly about 127 mm. at the age of 16, and about 118 mm. at the age of 30. The pressures for the women are grouped about 118 mm. at the age of 16; about 111 mm. at 24, and about 117 mm. at 40. Alvarez says that hypertension cannot be ascribed regularly to infections or to a strenuous life. It seems to be an inherited peculiarity, the appearance of which can be suppressed in women so long as the ovaries function well.

Continuous Basal Metabolism Study in Case of Exophthalmic Goiter.—A patient with exophthalmic goiter was observed by Sturgis while at rest in bed for 192 days. During this time the basal metabolism, resting pulse, food intake and body weight were determined practically every day. After a rest of several weeks in bed there was a tendency for the basal metabolism to become stabilized, and during a period of several months the variation on consecutive days rarely exceeded 5 per cent. The number of calories adequate to maintain a patient with exophthalmic goiter in caloric balance, when resting in bed, may be estimated as approximately an 85 per cent. increase over the number of calories which represent the patient's basal metabolism for twenty-four hours. Acute infections, such as an acute tonsillitis with fever, may exert a serious influence on a patient with exophthalmic goiter, owing to the great excess of heat produced and the large amount of weight which is lost as a consequence of a high basal metabolism and a small food intake. The menstrual periods did not exert an appreciable effect on the basal metabolism in this patient. Four roentgen-ray treatments over the thyroid gland at intervals of three weeks had no effect on the course of the disease. Ligation of two thyroid arteries was followed by a transient drop in the daily basal metabolism, and removal of approximately half of the gland had a similar effect.

Blood in Lymphocytosis.—Cytologic study of the blood in nine cases of benign lymphocytosis accompanied by adenoid hyperplasia has shown Downey and McKinlay that the blood picture is sufficiently characteristic to warrant inclusion of all of the cases in one large group. The blood is characterized by the presence of a relatively large number of atypical "leukocytoid" lymphocytes, which show sufficient variation in structure to suggest division of the cases into three types. The abnormal cell characters may be interpreted as due to higher differentiation and special cell activity. In one case, these characters were combined with the nuclear signs of immaturity in a few cells. The blood of this case contained some other leukemic features, but they were not sufficient to warrant a diagnosis of acute leukemia. Special attention was given to comparison of these specimens of blood with the picture in acute leukemia. In every case, it was possible to determine the nonleukemic nature of the blood, even though the clinical picture suggested acute leukemia. A detailed comparison was made between one of these cases and one case of acute lymphatic leukemia having a total leukocyte count and lymphocyte percentage. A case of mouth infection with similar counts is described, and it is shown that the blood cytology is totally different from that of the leukemic case and from the group of cases of benign lymphocytosis. All three cases showed clinical symptoms of acute leukemia, but the blood picture differed in each case, and was sufficiently characteristic to permit correct diagnosis.

Fatal Cases of Malabsorption of Fat.—Three cases are presented by Blumgart, which, because of certain features which they shared in common, suggested a possible clinical entity; the disease tended to occur in early middle life, with insidious onset, gradual downward progression over a period of one and a half to two years, and final termination in death. The presenting symptoms were weakness, emaciation, and, on an average, three soft, semisolid, yellow bowel movements daily, containing an excess of fat. Acidosis and tetany were noted in two cases. In the two cases tested, there was an absence of free hydrochloric acid in the gastric contents. Examination of the blood showed a secondary anemia of from 2,500,000 to 3,000,000 per cubic millimeter, a color index of approximately 1, but no other indications of primary anemia. All of the special studies and tests were essentially negative. Pathologically, the significant changes were confined to the intestines and to the mesenteric lymph nodes. In all three necropsies, only incidental changes were found elsewhere. The small intestine showed small granular elevations of the mucosa, usually gray in appearance. Microscopically, these elevations were found to consist of phagocytes containing ingested fat. The phagocytes were large, mononuclear, and contained a foamy reticulated cytoplasm. The lymph nodes were noticeably enlarged and hyperplastic, and contained phagocytes, with ingested fat.

Milky Effusions.—Seven cases are recorded by Blankenhorn in all of which milky fluids were found. In one case, in which the patient had a tumor of the mediastinum, the fluid contained large amounts of fat in coarse and fine emulsions. This fluid can well be called chylous. In the remaining six cases, in all of which the patients were known to have lesions capable of effusion from chyliferous or blood vessels, the fluids contained smaller amounts of fat, in fine emulsion; these fluids might be classed as pseudochylous, but the only difference between them and the first fluid is that they lacked large fat particles.

Archives of Surgery, Chicago

7: 1-236 (July) 1923

*Pyogenic Infection of Parotid Glands and Ducts. V. P. Blair and E. C. Padgett, St. Louis.—p. 1.
*End Results of Surgery of Thyroid. J. D. Pemberton, Rochester, Minn.—p. 37.
*Histopathology and Etiology of Varicose Veins. B. B. Nicholson, Charlottesville, Va.—p. 47.
Physiology of An Arteriovenous Fistula. E. Holman, Baltimore.—p. 64.
*Skin Signs or Viscerosensory Phenomena in Acute Appendicitis. E. M. Livingston, New York.—p. 83.
Studies in Experimental Traumatic Shock. McK. Cattell, Boston.—p. 96.
Prolonged Intravenous Infusion and Clinical Determination of Venous Pressure. W. G. Penfield and D. Teplitsky, New York.—p. 111.
Blood Transfusion: Study of Two Hundred and Forty-Five Cases. G. H. Cepher, St. Louis.—p. 125.
Studies in Exhaustion: V. Hemorrhage. G. W. Crile, Cleveland.—p. 154.
*Chemical Pathology of Pyloric Occlusion in Relation to Tetany. H. A. Murray, Jr. New York.—p. 166.
Traumatic Lesions of Intestine Caused by Nonpenetrating Blunt Force. B. M. Vance, New York.—p. 197.
*Viability of Bone After Removal from Body. S. L. Haas, San Francisco.—p. 213.
Desmoid Tumors: Report of Thirty-One Cases. R. W. Nichols, Rochester, Minn.—p. 227.

Pyogenic Infection of Parotid.—Experience in dealing with pyogenic parotitis has lead Blair and Padgett to three practical conclusions: (1) Acute suppurative parotitis is, in the great majority of cases, an ascending infection from the duct related to decreased salivary flow, fever and depressed general condition. (2) Early adequate liberation and drainage of the parotid gland is a safe and useful procedure in all cases; it may be life saving. (3) Meatotomy of the duct is useful in certain cases of parotitis associated with obstruc-

tion not due to stones. Thirty-five cases of acute parotitis are reported. The death rate for the series was 42.8 per cent. Of these thirty-five cases, eight were so mild as to require no treatment. Eight cases were terminal involvements for which no special parotid treatment was given. Of the sixteen patients operated on, five died before the parotid wound healed. Among seventeen other cases reported, three patients developed a salivary fistula; in eight cases there was something which suggested that the glandular trouble was associated with, or dependent on, a partial obstruction of the duct, and that when suppuration occurred it was secondary to this obstruction. Stones were demonstrated in a few of these cases. Nine cases are reported that represent more chronic types in which the presenting symptom was lack of free drainage of saliva and in which, from the history, it appears to have recurred several times. In the first three cases the duct was split at operation, which was performed with the idea of widening the meatal constriction to aid drainage. In one case, the natural opening of Stenson's duct was situated close to the gingiva of the second upper molar tooth, and this malposition was thought to be the cause of the chronic infection of the duct. Four additional cases could not be classified in any particular group. Each represented a case in which the etiology was more or less obscure. No particular treatment was recommended.

End-Results of Thyroid Surgery.—At the Mayo Clinic, during 1922, there were 1,983 operations on 1,497 patients with goiter, with a mortality by operation of 0.95 per cent. and by case of 1.2 per cent.

Cause of Varicose Veins.—Nicholson's investigation was concerned primarily with varicose veins of the lower extremities, and more particularly with the etiology of the condition. Various theories have been advanced to explain the dilatation of the vessels. Nicholson's theory is that various factors are operative, each somewhat dependent on the other. Since the saphenous opening is always protected by two or more valves, and the saphenous wall must at least intermittently bear the weight of the contained column of blood, it appears that the primary cause for varicose veins of the leg is not valvular insufficiency and static pressure. On the other hand, valvular insufficiency, which allows an ill directed and retarded blood flow, is a very important secondary factor. The infrequency of varices in the arms, where the weight of the column of blood in the veins is from a level only a little above the elbow, proves that static pressure is a secondary factor. Similarly, the relatively less severe process in the upper saphenous, as compared with lower levels, supports this conclusion. The primary cause may be mechanical, trophic, inflammatory or toxic. Valves in the veins of the leg do not relieve the vessel wall of the static pressure exerted by the contained column of blood. During the brief interval of contraction of the muscles of the leg, the static pressure of the column of blood above the site of contraction is not exerted on the vessel wall below. Even during this interval the vessel wall is not relieved of any pressure, for the arterial pressure in the lower part of the vessel must be greater than the static pressure normally exerted by the column of blood in the saphenous. The chief functions of the valves are: (*a*) to aid the muscles as they contract in pumping the blood toward the heart; (*b*) to direct the blood toward the heart; (*c*) to protect the openings of small branches from a backward flow, and (*d*) to prevent blood from being forced backward by intermittent muscular or mechanical pressure. An erect posture, demanding little activity of the legs, tends to induce varicosis, or aggravates the condition, if already present.

Skin Symptoms of Acute Appendicitis.—The basis of Livingston's test is the comparison of the slight discomfort caused by a vigorous twisting pinch of noninvolved skin with the severe pain caused by twisting involved skin within a certain triangle. A line from the umbilicus to the highest point on the right iliac crest forms the upper side; a line carried from this point to the right pubic spine forms the lower side, and a line from the right pubic spine to the umbilicus closes the triangle. Skin signs within this triangle, and maximal at its center, constitute confirmatory evidence of appendicitis. When the signs extend definitely beyond its borders on the anterior abdominal wall, or are maximal elsewhere, they are considered negative for appendicitis. Skin signs above the superior line of this triangle suggest cholecystitis, etc., while those below its inferior line suggest right renal colic, etc. In a series of seventy-five consecutive cases clinically diagnosed as acute appendicitis, the skin signs were positive in fifty-four and negative in twenty-one instances. All patients presenting positive signs had acute appendicitis; eleven of those presenting negative signs had gangrenous or perforative appendicitis. In the remaining ten negative cases, the findings were: general peritonitis of unknown origin, one case; pneumonia, two cases; acute gastrititis, one case; pulmonary tuberculosis, two cases; right renal calculus, the skin signs being present on the upper and inner portion of the right thigh, one case; hemorrhagic ovarian cyst, the skin signs being present over the middle of Poupart's ligament only, one case. In none of these ten cases was acute appendicitis present.

Chemical Pathology of Pyloric Occlusion.—It is considered by Murray that the five cases presented, the experiments summarized and the literature cited make the assumption that nerve irritability is increased by a fall in the hydrogen ion concentration of the blood or by a rise in the sodium: calcium ratio highly probable. The latter may be brought about by adding dissociable sodium compounds or precipitating calcium. Whether the hydrogen ion is active because of its effect on the cation ratio is still an open question. The treatment of gastric tetany is operative. As far as is known, it is always the result of obstruction of the pylorus, due to gross pathologic changes. There are other forms of tetany that are not associated with pathologic gastric conditions, from which it must be differentiated. This can usually be done by suitable blood analyses.

Viability of Bone After Removal from Body.—The experimental evidence submitted by Haas shows that the osteoblastic cells of bone will survive an exposure period of nineteen hours in air at room temperature. There is sufficient active retained vitality in the exposed cells to form callus, and, in some instances, union of a fractured bone after its transplantation into a muscle of the same animal, independent of any other source of osseous elements. The demonstration of the survival of the cells of bone after removal from the host adds uncontroverted evidence to prove that the osteoblastic cells of a bone graft play an independent active rôle in the processes of regeneration.

Boston Medical and Surgical Journal

189: 125-160 (July 26) 1923

Function of Municipal Hospital. F. W. Peabody, Boston.—p. 125.
Municipal Hospitals from Trustee's Viewpoint. H. S. Rowen, Boston.—p. 129.
Some Newer Developments in Hospitals. C. A. Coolidge, Boston.—p. 131.
*Analysis of One Hundred and Eighty Cases of Pneumonia with Necropsies. Anatomic Complications and Bacterial Causes. H. M. Feinblatt, Brooklyn.—p. 136.
Effect of Blood Sugar Level on Suprarenal Secretion and Sympathetic Activity. W. B. Cannon and S. W. Bliss, Boston.—p. 141.
Case of Filariasis Apparently Contracted in Boston. G. C. Shattuck, Boston.—p. 142.
Case of Cambric Needle in Stomach Wall. J. W. Lane, Boston.—p. 144.

Anatomic Complications of Pneumonia.—Feinblatt summarizes the anatomic complications and the bacteriologic causes of infection in 139 cases of lobar pneumonia and forty-one cases of bronchopneumonia which came to necropsy at Base Hospital No. 101, St. Nazaire, France, during 1918. In reference to lobar pneumonia, the principal anatomic complications were pleural empyema (38.1 per cent.), purulent pericarditis (17.2 per cent.), toxic nephrosis (10.7 per cent.), fibrinous pleurisy (9.3 per cent.), and cardiac dilatation (8.6 per cent.). The pneumococcus alone was the organism responsible for the infection in 9.7 per cent. of the cases; with the streptococcus, it accounted for 2.3 per cent. In reference to bronchopneumonia, the principal anatomic complications were pleural empyema (9.7 per cent.), cardiac dilatation (9.7 per cent.), toxic nephrosis (7.3 per cent.), and empyema of the cranial sinuses (7.3 per cent.). The strepto-

coccus alone was the organism responsible for the infection in 34.7 per cent. of the cases; the pneumococcus, in 21.7 per cent.; the bacillus of tuberculosis, in 13 per cent.

Journal of General Physiology, Baltimore

8: 709-879 (July 20) 1923

Exosmosis in Relation to Injury and Permeability. W. J. V. Osterhout, Cambridge, Mass.—p. 709.
Penetration of Dyes as Influenced by Hydrogen Ion Concentration. M. Irwin, Cambridge, Mass.—p. 727.
Comparative Studies on Respiration. XXVII. The Mechanism of Oxidation in Relation to Chloroform Anesthesia. G. B. Ray, Cambridge, Mass.—p. 741.
Purification and Precipitation of Casein. J. H. Northrop, New York.—p. 749.
Inactivation of Trypsin. IV. Adsorption of Trypsin by Charcoal. J. H. Northrop, New York.—p. 751.
Structural Units of Starch Determined by Roentgen Ray Crystal Structure Method. O. L. Sponsler, Los Angeles.—p. 757.
*Effect of Gestation on Rate of Decline of Milk Secretion with Advance of Period of Lactation. S. Brody, A. C. Ragsdale and C. W. Turner, Columbia, Mo.—p. 777.
Studies in Protoplasm Poisoning. I. Phenols. L. P. Shachell, Chicago.—p. 783.
Relation Between Electrical Conductivity of External Medium and Rate of Cell Division in Sea Urchin Eggs. R. S. Lillie and W. Cattell, Cleveland.—p. 807.
Dissection of Chromosomes in Pollen Mother Cells of Tradescantia Virginica. L. R. Chambers and H. C. Sands, New York.—p. 815.
Mechanism of Entrance of Sperm into Starfish Egg. R. Chambers, New York.—p. 821.
Theory of Regeneration Based on Mass Action. J. Loeb, New York.—p. 831.
Theory of Geotropism Based on Mass Action. J. Loeb, New York.—p. 853.

Effect of Gestation on Milk Secretion.—Data are presented by Brody, Ragsdale and Turner showing that the course of decline of milk secretion with the advance of the period of lactation in farrow cows follows the course of decline of a monomolecular chemical reaction; that is, each month's milk production is a constant percentage of the production of the preceding month (94.77 per cent. in the case of the cow under consideration), from which it is inferred that milk secretion is limited by a chemical reaction initiated at parturition, and declining with the decrease of the concentration of the limiting substance as it is transformed into milk. Data are also presented showing that the decline in milk secretion due to pregnancy is related to the increase in weight of gestating animals, from which it is inferred that growth of the fetus is, in part, at least responsible for the decline in the milk flow due to the demand of the fetus for nutrients to support its life processes.

Journal of Laboratory and Clinical Medicine, St. Louis

8: 631-698 (July) 1923

*Normal Urine Sugar Curve in Normal Persons, Borderline Diabetics and Severe Diabetics Under Insulin Treatment. I. H. Page, Indianapolis.—p. 631.
Significance of Negative Results in Blood Cultures. H. B. Kipnis, Chicago.—p. 651.
*Toxicity of Cocain as Influenced by Rate of Absorption and Presence of Epinephrin. E. L. Ross, Chicago.—p. 656.
*Method for Isolation of Leukocytes. P. Szilard, Budapest, Hungary.—p. 661.
Clinical and Laboratory Procedures in Pediatrics. A. Levinson, Chicago.—p. 664.
Effect of Buffer Salts on Blood Coagulation. B. Jablons, New York.—p. 679.
*Familial Hypertension: Report of Case. J. Rosenbloom, Pittsburgh.—p. 681.
Portable Irrigation Apparatus for Treatment of Wounds with Liquid Antiseptics. B. Douglas, New Haven, Conn.—p. 684.
Simple Air Interrupter. R. F. Hacking, Richmond, Va.—p. 687.
Standard Wassermann Reaction. R. Ottenburg and I. Wisler, New York.—p. 690.
Kottmann Reaction for Thyroid Activity. Carbon Dioxid in Tested Serum. S. Morse and C. M. Fitch, Columbus, Ohio.—p. 692.
Simple Method for Obtaining Guinea-Pigs' Blood for Complement. B. S. Levine, Waukesha, Wis.

Determining Hourly Urine Sugar Curve.—The hourly urine sugar curve has been determined by Page in normal persons, borderline diabetics, cases of severe diabetes under insulin treatment, renal diabetes, borderline glycosuria under insulin treatment and hyperthyroid cases. A standard technic is described for the determination of the hourly sugar curve. Page believes that the curve will demonstrate cases of mildly pathologic sugar metabolism that would be overlooked by the ordinary tests for such conditions.

Factors Affecting Toxicity of Cocain.—Ross found that the minimum fatal dose of cocain for cats varies with the rate of administration. As the rate of introduction of cocain increased, the minimal lethal dose of cocain first decreased and then gradually increased up to the end of the series. The minimal lethal dose of cocain hydrochlorid for chloretoned cats under these conditions is 0.0128 gm. cocain per kilogram of body weight. Epinephrin markedly increases the toxicity of cocain.

Method for Isolation of Leukocytes.—The essential point of Szilard's method is the destruction of the red blood corpuscles and the thrombocytes in a manner which will leave the white cells unimpaired. The following solutions are required: (1) 2.5 per cent. solution of acetic acid; (2) 2 per cent. solution of tartaric acid; (3) 2 per cent. solution of potassium hydroxid, and (4) Locke's solution. The blood is defibrinated, hemolyzed, alkalinized, washed in Locke's solution, and the white cells are stained. The detailed technic is given.

Familial Hypertension.—The family tree given by Rosenbloom suggests strongly that heredity produced in this group either a congenital aplasia of the arterial system, or a susceptibility to some endogenous toxic substance whose effect showed itself between the ages of 40 and 45. Both parents died at 45 from cerebral hemorrhage. One daughter, aged 47, died from cerebral hemorrhage. Two daughters, aged 35 and 33, respectively, are well, as yet. Four daughters, aged 40, 44, 46 and 49, respectively, have hypertension. Three sons, aged 42, 45 and 47, respectively, died. All had hypertension.

Journal of Urology, Baltimore

10: 1-97 (July) 1923

*Complete Urinary Obstruction Due to Hydatid Cyst. C. L. Deming, New Haven, Conn.—p. 1.
Hydronephrosis: Report of Six Cases. W. C. Quinby, Boston.—p. 45.
*Absorption from Urinary Tract. J. A. H. Magoun, Jr., Rochester, Minn.—p. 67.
Case of Tuberculosis of Adenomatous Prostate. J. D. Barney, Boston.—p. 81.
Differentiation Between Tuberculous and Nontuberculous Inflammation of Epididymis. A. R. Stevens, New York.—p. 85.
Tunnelled Sounds and Modification of Maisonneuve Urethrotome. B. H. Caples, New York.—p. 93.

Complete Urinary Obstruction Due to Hydatid Cyst.—A case of multiple echinococcus infection, with cysts in the liver, diaphragm and pelvis, and general fibropurulent peritonitis, is reported by Deming, and 47 cases found in literature are reviewed briefly. Of the 48 cases with complete urinary obstruction due to hydatid cyst, 7 were not treated; 25 of the 41 patients treated recovered; 14 died; 1 patient developed incontinence and 1 improved. Of those operated on, 60.9 per cent. were cured and 34.1 per cent. died; 5 per cent. developed fistula or some other chronic condition. Error in diagnosis is responsible for at least 50 per cent. of the mortality, while secondary infection produced by suprapubic or rectal puncture is responsible for 40 per cent. of the deaths.

Absorption from Urinary Tract.—Experiments made by Magoun showed that certain dyes and bacteria can be absorbed from the normal kidney, ureters and urethra. A small amount of dye can be absorbed from the normal and acutely inflamed bladder. Bacteria could not be recovered in the blood stream or various organs after injection into either the normal or acutely inflamed bladder. In considering the relative absorbability, the kidney would seem to have the greatest absorptive power, with the urethra second and the ureter third. It would appear that, both experimentally and clinically, bacteria may pass from the pelvis of the kidney into the blood. In certain clinical cases the kidney, once infected, may act as a focus for a secondary bacteremia.

Military Surgeon, Washington, D. C.

53: 1-88 (July) 1923

Newer Epidemiology. F. H. Garrison.—p. 1.
Use of Yerkes-Bridges Point Scale in Intelligence Tests. A. T. Cooper.—p. 15.
Supply Functions of Medical Officer. N. L. McDiarmid.—p. 19.
Two Calculating Charts. C. B. Wood.—p. 39.
Use of Steam Jet for Delousing Railway Coaches. L. H. Dunn, Ovid, N. Y.—p. 42.
Examination of Patient. T. E. Scott.—p. 45.
Efficient State Military Medical Department. J. Frank.—p. 58.

Northwest Medicine, Seattle

6: 189-224 (June) 1923

Appraisal of Endocrinology. R. G. Hoskins, Columbus, Ohio.—p. 189. (To be conc'd.)
Prodromal Symptoms of Headache Due to Constipation. E. C. Fishbaugh, Los Angeles.—p. 195.
Institutional Treatment of Tuberculosis. P. Schonwald, Seattle.—p. 198.
Basal Conditions in Estimation and Interpretation of Basal Metabolic Rate. B. Holcomb, Portland, Ore.—p. 203.
Use of Insulin in Diabetes Mellitus. L. J. Palmer, Seattle.—p. 207.
Indicanemia an Early and Very Dependable Symptom of Renal Insufficiency. G. Baar, Vienna, Austria.—p. 210.
Protheses After Removal of Auricle for Carcinoma. R. A. Fenton and I. M. Lupton, Portland, Ore.—p. 212.

Philippine Island Medical Association Journal, Manila

3: 117-168 (May-June) 1923

Manual Extraction of Placenta. Its Morbidity and Mortality and Its Effect on Placenta Acreta. H. Acosta-Sison.—p. 117.
Methods of Diagnosis and Treatment of Empyema of Maxillary Sinus. F. Nicolas.—p. 121.
*Gallbladder Perforation in Typhoid Fever: Report of Case. A. B. M. Sison.—p. 125.
Coordinated Effort in Sanitation. C. N. Leach.—p. 127.
Cooperation Necessary Between Medical Association and Government in Philippines on Legislation Pertaining to Medical and Public Health Matters. J. C. Nanagas.—p. 131.
Spinal Percussion in Diagnosis of Certain Intrathoracic Diseases. W. J. B. Burke.—p. 135.

Gallbladder Perforation in Typhoid.—In trying to offer an explanation for the production of this complication, Sison suggests the possibility of the typhoid bacilli having multiplied in the gallbladder in such overwhelming manner that they rendered the bile so thick as to cause stagnation first, and, later, obstruction of the biliary passages, thereby starting local traumatism and injury. Then, with the general lowering of resistance of the patient on account of the general infection, an ascending inflammatory process, starting in the duodenum, may have taken place. Then the secondary invaders, namely, *B. coli* and other pyogenic organisms, came to help in this destructive enterprise, and a locus minoris resistentiae was established in the gallbladder wall which subsequently became the site of the perforation. The previous history and habits of the patient do not help at all in establishing the contributory factors for his complication, because they are entirely negative.

Surgery, Gynecology and Obstetrics, Chicago

37: 1-126 (July) 1923

*False Diverticula of Jejunum. F. Helvestine, Jr., University, Va.—p. 1.
*Diverticulum of Duodenum: Report of Case. N. J. MacLean, Winnipeg, Man.—p. 6.
Postoperative Ventral Hernia. J. C. Masson, Rochester, Minn.—p. 14.
Lung Compression by Heavy Liquid Paraffin in Treatment of Lung Tuberculosis, Bronchiectasis and Lung Abscess. F. W. McGuire, Buffalo.—p. 20.
*Rare Malformation of Vulva. F. Ronchese, Venice, Italy.—p. 22.
Endotheliomata of Uterus: Report of Case. D. P. Murphy, Rutherfordton, N. C.—p. 24.
Syphilis of Uterus and Adnexa. B. Portis, Chicago.—p. 37.
Atrophy of Liver with Nodular Hyperplasia. E. H. Pool and F. W. Bancroft, New York.—p. 44.
*Aberrant Gastric Mucosa. Report of Two Cases. An Umbilical Polyp and Meckel's Diverticulum. E. Stone, Boston.—p. 51.
*Placental Iron and Its Relationship to Icterus Neonatorum. A. C. Williamson, Pittsburgh.—p. 57.
Tumors of Breast. C. E. Black, Jacksonville, Ill.—p. 63.
Stricture of Bulbous Region. G. D. Lombardo, Mexico City, Mexico. —p. 69.
Analysis of Two Thousand Four Hundred and Sixty-Eight Herniotomies. J. P. Hoguet, New York.—p. 71.
*Ether Lavage; Its Logical Use Locally as an Antiaggressin. G. de Tarnowsky, Chicago.—p. 76.
Near Normal Restoration of Limb Afflicted with Disabling Consequences of Old Pott's Fracture. F. Reder, St. Louis.—p. 82.
Spot-Light in Surgery. J. G. R. Manwaring, Flint, Mich.—p. 86.
Quilting Remaining Lobe as an Emergency Procedure During Thyroidectomy for Exophthalmic Goiter. H. G. Sloan, Cleveland.—p. 88.

False Diverticula of Jejunum.—Helvestine describes two cases of false diverticula of the jejunum, and considers the etiologic factors involved. A consideration of these cases, together with those described in the literature, discloses three factors operating conjointly in the formation of acquired diverticula: (1) traction by the mesenteric vessels, or traction following adhesions; (2) degeneration of the intestinal musculature and (3) intra-abdominal pressure. Acquired diverticula develop first as true diverticula but later lose their muscular coat and become false diverticula.

Diverticulum of Duodenum.—Maclean reports a case in which the diverticulum was imbedded in the head of the pancreas causing chronic hypertrophic pancreatitis with symptoms simulating those of severe biliary colic. He performed a transduodenal diverticulectomy. The diverticulum was freed by blunt dissection, inverted into the lumen of the duodenum, ligated, and removed.

Rudimentary Pseudofeminine Hermaphroditism.—Ronchese describes this anomaly as an apparently rudimentary pseudofeminine hermaphroditism. The case is considered interesting only from the morphologic side, as an anomaly of the labia and vagina (of the lower portion) caused by incomplete development, and simulating a rudimentary feminine pseudohermaphroditism, was associated with an abnormal meatus.

Aberrant Gastric Mucosa.—The two cases recorded by Stone increase the fatal number in the literature to forty-four. He says, that umbilical polypi bearing cells which could have developed from the splanchnopleura are remnants of the vitelline ducts. The mucous membrane on the surface of these tumors may be the result of a process of evagination, central necrosis and subsequent fibrosis of a tubular element. The original cells lining the vitelline duct have the power of differentiating into any type of cell that the foregut is capable normally of developing. The actual factors producing the abnormal stimulation, or lack of stimulation, for the obliteration of the vitelline duct are unknown.

Placental Iron and Icterus Neonatorum.—All new-born infants, according to Williamson, have bilirubinemia corresponding to the iron content of the placenta. There is a definite relationship between icterus neonatorum and placental iron content. Jaundice of the new-born may thus be considered as purely rynamic or hemolytic in origin. The nonicteric infants, all of whom, nevertheless, have a certain degree of bilirubinemia, are without jaundice because their placental iron content is below the level necessary for the appearance of jaundice.

Ether Lavage of Peritoneal Cavity.—DeTarnowsky believes that ether lavage is a local and general adjuvant to nature's combative and reparative forces, i. e., it is an antiaggression. Whenever, from any pelvic or abdominal source of infection, free or localized pus is found, the organ or organs involved are first of all treated according to indications. Pus is wiped or preferably suctioned without breaking down protective barriers if any exist and the surgeon begins to close the peritoneum. While doing this, 1 ounce of ether is poured into the pelvic or peritoneal cavity, without attempting to wash or otherwise disturb the normal relation of any of the abdominopelvic organs. No swabbing out is done, but the peritoneum is closed as rapidly as possible in order to minimize the loss of ether through evaporation. The anesthetic is not interrupted. Drainage, exclusively of the cigaret variety, should be instituted only when it has been impossible to remove all macroscopically necrotic tissue or when a fistula is either present and cannot be closed, or is probably going to occur.

Texas State Journal of Medicine, Forth Worth

19: 157-210 (July) 1923

Importance of Vital Statistics in Health Work. W. T. Davidson, Dallas.—p. 169.
State Sanitary Code: Its Scope and Methods of Enforcement. O. Dowling, New Orleans.—p. 170.
Importance of Disease Prevention. A. H. Flickwir, Houston.—p. 172.
What Public Should Know About Public Health. N. D. Buie, Marlin. —p. 174.
*Malta Fever in Southwest. J. W. Tappan, El Paso.—p. 176.
Eradication of Malarial Fever from Texas. A. Woldert, Tyler.—p. 178.
*Epidemiology and Prevention of Dengue. M. D. Levy, Houston.—p. 182.
Relation of Purification of Municipal Water Supplies to Public Health. L. O. Bernhagen, Beaumont.—p. 184.
Present Status of Texas Drinking Water Supplies. V. M. Ehlers, Austin.—p. 187.
Stock Poisoning Plants of Range. C. D. Marsh, Washington, D. C.—p. 188.

Malta Fever in Southwest.—According to Tappan, malta fever is endemic in parts of the Southwestern states and Mexico, hence goat's milk furnished to any community should

be produced under competent supervision—especially where conditions exist which are favorable to the spread of malta fever. The necessity for routine serologic examination of all goat herds, whether furnishing milk to communities or being used for other purposes, should be considered.

Epidemiology of Dengue.—In 1918, and again in 1919-1920, Cleland, Bradley and McDonald, working in Australia, by a series of carefully controlled experiments, both on human beings and the lower animals, proved that *Stegomyia colopus*, now known as *Aedes aegypti*, was the mosquito transmitting the infection of the Australian epidemic of dengue. Reports from other parts of the world have thrown considerable doubt on *Culex quinquefasciatus* as a vector of the disease, and have strengthened the belief that *Aedes aegypti* should have this added to his score. That Texas was plagued during the past summer by innumerable hordes of *Stegomyia*, Levy says, is common knowledge, and the association of dengue with the presence of these mosquitoes is hardly one of coincidence. *Aedes aegypti* was undoubtedly the most prevalent and most likely vector.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

28: 33-64 (July) 1923

Mackenzie Davidson Memorial Lecture. A. W. George.—p. 33.
Treatment of Menorrhagia by Radium. G. Blacker.—p. 47.
Unusual Calcareous Deposits in Soft Tissues of Hands. J. R. Logan. —p. 55.
Radiography of Knee Joint. E. Scott.—p. 57.
Discrepancy in Values of Secondary Voltage Given by Spectrometer and Equivalent Spark-Gap. W. E. Schall.—p. 59.

British Journal of Ophthalmology, London

7: 353-400 (Aug.) 1923

Embryology of Congenital Crescents. I. C. Mann.—p. 359.
Prophylaxis Against Blennorrhea Neonatorum in Denmark. G. Norrie. —p. 374.

British Medical Journal, London

2: 91-134 (July 21) 1923

Study of Nature as Shedding Light on Structure and Functions of Man. Antler of Deer and Its Relation to Growth of Bone. W. Macewen.—p. 91.
*Normal and Morbid Conditions of Suprarenals in 100 Hospital and Asylum Cases: with Special Reference to Dementia Praecox. F. W. Mott and I. E. Hutton.—p. 95.
*Nature of So-Called Rheumatoid Arthritis and Osteo-Arthritis: Summary of Investigation into Pathologic Changes, with Plea for Scientific Classification. A. G. T. Fisher.—p. 102.
Case of Fever Due to Bacillus Paratyphosus C. E. Wordley.—p. 105.
Differential Diagnosis of Smallpox and Chickenpox. W. McC. Wanklyn. —p. 106.

2: 135-164 (July 28) 1923

Environment and Health. C. P. Childe.—p. 135.

Blood Pressure in Dementia Praecox.—In their blood pressure studies in 143 cases Mott and Hutton found that in 10 of the cases of katatonic dementia praecox, and in 4 of the 27 cases of hebephrenic dementia praecox the blood pressure was under 100; whereas in 12 cases of epilepsy, in 15 cases of general paralysis, and in 9 of the 10 cases of congenital imbecility there was not a single case in which the blood pressure was under 100; moreover, in 5 of the 10 cases of katatonia, and 2 of the 4 cases of hebephrenia, the blood pressure was very low, under 90. In not one of the cases of general paralysis was it under 120. The Goetsch test was made in fifty dementia praecox cases. Two cases only gave a normal reaction; these had a systolic blood pressure of 122 and 128, respectively. One was a katatonic and the other a simple dementia praecox case with congenital defect. Eighteen cases gave a moderate reaction; in 13 of these the blood pressure was 120 or under (minimum 104); in 5 it was over 120 (maximum 130). Thirty cases reacted only faintly; in 25 the blood pressure was 120 or under (minimum 98); in 5 it was over 120 (maximum 136). The test was repeated in cases with a high blood pressure which gave a faint reaction, and the same result was obtained. In several cases it was found that a faint reaction might be intensified by administration of thyroid extract, but without material alteration in the blood pressure.

Classification of Chronic Arthritis.—The suggested new nomenclature given by Fisher is as follows: chronic arthritis (A, monarticular; B, polyarticular); (1) synovial type (O. T., rheumatoid arthritis). The disease commences and remains more marked in the synovial membrane. The cartilage and bone may be invaded secondarily. Every gradation may be seen between the chronic types and the more acute forms which lead to ankylosis. (2) Chondro-osseous Type (O. T., osteo-arthritis). The disease commences and remains more marked in the articular end, the synovial membrane being involved later. (3) Mixed type. The disease commences simultaneously in synovial membrane and articular end of bone and the changes advance pari passu.

Journal of Tropical Medicine and Hygiene, London

26: 239-250 (July 16) 1923

*Two Cases of Rat Bite Fever. Rapid Cure by Intravenous Injection of Neo-Arsphenamin. E. C. Spaar.—p. 239.
*Case of Infection with Dientameba Fragilis, Jepps and Dobell. A. Robertson.—p. 243.
Intestinal Parasites in Sudan. V. S. Hodson.—p. 244.

Neo-Arsphenamin in Rat Bite Fever.—The noteworthy features of one of Spaar's cases were the rapid cure after only one injection of 0.45 gm. neo-arsphenamin, the pains on only the left side of the body, and the presence of nodular swellings in the skin. There was no rigor or chill before either of the paroxysms of fever, no pains had been felt in the joints and no rash was ever seen. Only before the first bout of fever was the bitten finger painful. There was no increase of the tendon reflexes, and no stiffness about the joints of the bitten finger. Profuse sweating accompanied defervescence on each occasion. The other patient received four injections of 0.2 gm. neo-arsphenamin before a cure was effected.

Infection with Dientameba Fragilis.—Robertson reports the case of a young woman who was admitted to hospital as a case of suspected entamebic dysentery. Her history revealed that she had been subject to bowel trouble in one form or another for the greater part of her life. During childhood and adolescence, which were spent in South America, she suffered from chronic constipation, and this condition persisted until she went to Egypt in 1916. She remained in Egypt from 1916 until 1919, and in the course of her stay there had several diarrheic attacks, which, however, were not associated with infection by any protozoal organism. At the end of her stay in Egypt she went to the Punjab, where she resided up to the time of her return to London early in 1922. While in India she had a severe attack of dysentery, and *Entameba histolytica* was in the stools. Since then she has suffered from recurrent attacks of diarrhea accompanied by pain and tenderness along the line of the large intestine which was frequently much distended. The stools were examined as a routine measure. In the sixth stool of the series *Dientameba fragilis*, Jepps and Dobell, 1917, was found, and thereafter no difficulty was experienced in demonstrating it in subsequent specimens.

Lancet, London

2: 105-154 (July 21) 1923

Bacteriologic, Toxicologic, Hemotologic Considerations Bearing on Psychoses. E. Goodall.—p. 105.
*Bronchomoniliasis. T. Jockes and R. H. Simpson.—p. 108.
Mental Tests for Delinquents, and Mental Conflict as Cause of Delinquency. M. H. Smith and G. W. Pailthorpe.—p. 112.
*Interrelationship of Blood Fat and Blood Sugar. T. H. Oliver and A. Haworth.—p. 114.
Tuberculosis Treated with Spahlinger's Vaccine. E. H. Colbeck and S. R. Gloyne.—p. 116.
*Acute Bacillus Coli Infection of Gastro-Intestinal Tract in New-Born Baby, Contracted from Its Mother. R. C. Jewesbury and L. S. Dudgeon.—p. 118.
Case of Quintuple Pregnancy. S. R. Foster and W. Carson.—p. 120.

Bronchomoniliasis.—According to Jockes and Simpson bronchomoniliasis is of more frequent occurrence than has hitherto been suspected. The clinical picture presents no distinctive feature. The long duration of the signs of pulmonary consolidation is notable, as is the persistence of the fungus in the sputum after the completion of convalescence—a feature indicative of the chronicity of the infection, and, perhaps, of the possibility of relapse. Six cases are reported. Two cases

presented an acute tonsillitis. Cultures made from the exudate yielded a plentiful growth of *Monilia pinoyi*. The diagnosis of bronchomoniliasis depends primarily on the repeated demonstration of the fungus in the sputum. It is essential that specimens should be collected into sterile vessels and washed repeatedly before cultivation. The patient should gargle with sterile sodium chlorid solution or with a dilute solution of potassium permanganate before expectorating. In cases of true infection a profuse growth occurs from cultures on Sabouraud's medium. In other cases experience has shown that, even when the preliminary washing of the patient's mouth is neglected, it is exceptional to obtain more than a very scanty growth, and that commonly none at all appears. In those cases in which the lesion is purely local those methods of investigation which aim at the detection of the organism in the circulation, or which depend on the recognition of specific general reactions are hardly applicable. There is, however, evidence to suggest that dissemination does occur and that the use of these methods for diagnostic purposes is worthy of trial.

Interrelationship of Blood Fat and Blood Sugar.—Evidence is presented by Oliver and Haworth to show that the blood sugar has a relation to the blood fat, other than that of a mere oxidizing agent. Fat properly absorbed into the tissues appears to increase the storage of carbohydrate; if not so absorbed, or if mobilized by calcium, the storage is interfered with. Possibly improper storage of the fat may account for the tendency of a high fat diet to produce glycosuria in some cases of diabetes. It is noticeable that practically all conditions which lead to a hyperglycemia lead to a lipemia as well; this may be attributed to diminished oxidation. The authors have been able to produce a distinct rise of blood fat in addition to a hyperglycemia by the injection of epinephrin (from 0.48 to 0.56 per cent.). In this case, at least, it is difficult to understand why the liberation of a large amount of oxidizing material should be accompanied by an increase of the substance to be oxidized. They suggest that a more probable explanation is that both were stored and liberated together, an explanation which recent work on the effect of insulin in diminishing lipemia does much to confirm.

Acute Colon Bacillus Infection in New-Born Baby Contracted from Mother.—The mother in the case cited by Jewesbury and Dudgeon had suffered from an infection of the urinary tract due to the colon bacillus, which had caused acute symptoms with high temperature, and the usual associated clinical phenomena, on two occasions during the antenatal period. The urine contained a large amount of pus and masses of bacilli and the lochia also were similarly infected. In the opinion of the authors the baby was infected at birth by swallowing the urine or lochia in which the organism was present in abundance. This view is supported by the fact that the illness commenced about three days after birth, and the condition of the child at birth was perfectly satisfactory. The illness commenced and continued with gastro-intestinal symptoms and associated clinical phenomena. The child passed thick mucus by the bowel for some weeks and also vomited mucus. The causative organism was present in the intestinal mucus for many weeks, and eighteen weeks from the onset of the illness it was present in the vomited material during a gastro-intestinal upset. At this period the urine was found to show a bacilluria due to the same organism. The illness was so severe that it nearly cost the life of the child, and improvement only occurred after many weeks of most careful nursing and treatment. Repeated examination failed to disclose bacilli in the mother's milk.

2: 155-210 (July 28) 1923

Environment and Health. C. P. Childe.—p. 155.
Primary and Secondary Resistance to Induction of Cancer. J. A. Murray.—p. 159.
*Immediate Prognosis in Nephritis. O. L. V. De Wesselow.—p. 163.
Insulin. J. J. R. MacLeod.—p. 198.
Typhus Fever Epidemic Among Greek Refugees. P. Hehir.—p. 209.
*Secondary Anemia in Infancy. H. M. M. Mackay.—p. 165.

Prognosis in Nephritis.—With the increasing application of chemical methods to the study of the disease, the accuracy of prognosis in nephritis has made a considerable advance. The bulk of modern work has centered round the question of the retention of the nitrogenous waste products in the blood, and has more especially concentrated on the urea content of the blood, on account of the ease and accuracy with which this substance can be estimated. There can be no doubt, however, says De Wesslow, that an estimation of the urea content of the blood in cases of severe azotemic nephritis does not necessarily settle the question of the immediate prognosis. A blood urea content as high as 300, or even, in rare instances, 400 mg. per hundred c.c., is not incompatible with recovery in an acute case, and even in chronic types of nephritis, in which the capacity for recovery is of necessity less, a blood urea content of from 100 to 200 mg. does not necessarily imply speedy death. A confident prognosis can, therefore, scarcely be ventured on from an estimation of the blood urea alone, and several estimations at intervals of some days may be necessary before an opinion on the immediate outlook can be given. A plea is entered for the value of a determination of the plasma content in inorganic phosphorus (phosphate) in estimating the probable outcome of a case of azotemic nephritis. Phosphate retention is associated with certain definite chemical changes in the blood, with are apparently of importance in the symptomatology of uremia. The retention of the nitrogenous waste products is a useful guide to the degree of renal damage present, but in itself is apparently harmless; phosphatic retention, on the other hand, appears to involve certain deleterious results. Though retention of phosphates is undoubtedly associated with impairment of nitrogenous excretion, and though, when a series of cases is averaged, it is found that the rise in the plasma phosphate closely corresponds to the degree of urea retention, in individual cases marked differences in the degree of retention of the two bodies occur. Thus, there may be a high blood urea with a relatively low plasma phosphate content, and conversely. The cause of these differences in the degree of retention of the two bodies is uncertain; the available evidence would appear to suggest that they are the result not so much of variations in excretion as of variations in the diet, and in the demand for phosphorus and nitrogen for anabolic purposes.

Secondary Anemia in Infancy.—There is a general consensus of opinion that too prolonged and too exclusive a milk dietary produces anemia in infants and young children. This, according to MacKay, is probably due, in part at least, to iron starvation, on account of the low iron content of milk. Some writers, however, have held that it is directly connected with a toxic effect resulting from excessive milk consumption. Premature infants are known to be particularly liable to this form of anemia. In a group of thirty-six artificially-fed infants receiving milk or milk and carbohydrate diets, with or without cod liver oil, the majority developed anemia. It was usually noted toward the end of the first year of life, but sometimes appeared as early as the seventh month. Additions of vegetables to the diet, at the age of from 6 or 7 months, did not prevent anemia. The infants were in well lighted and well ventilated wards, and were much out of doors in summer, but very little in winter. Treatment by the administration of inorganic iron salts by mouth brought about improvement in the majority of cases treated, but not in all, possibly because treatment was not continued for a sufficient length of time. No improvement was noted in the hemoglobin content of the blood in any case within three to four weeks from the beginning of treatment, and improvement might be delayed for six weeks with, thereafter, rapid progress. It is suggested that many cases of anemia in infants, particularly those occurring in artificially fed infants at an early age, are probably associated with iron starvation, more especially as it has been demonstrated experimentally that the iron retention of an infant on cow's or goat's milk is much lower than that of an infant on human milk.

Annales de l'Institut Pasteur, Paris

37: 547-626 (June) 1923

*Experimental Syphilis in Monkeys. M. Nicolle.—p. 547.
*Pentavalent Arsenic in Therapeutics. E. Fourneau et al.—p. 551.
*Origin of Endemic Plague. D. Zabolotny.—p. 618.

Syphilis in Monkeys.—Nicolle describes his hitherto unpublished experimental research in 1890. The findings have been confirmed by others since.

Relation Between Therapeutic Action and Constitution of Derivatives of Phenylarsinic Acid.—This article is an exhaustive study of pentavalent arsenic and its derivatives in treatment of experimental infections with trypanosomes and spirilla, with efforts to enhance the action by modifying the molecular construction.

Origin of Endemic Plague.—Zabolotny states that every year since 1898 there have been cases of plague in southeastern Russia, with a total of 1,931 to the close of 1914. The Institute of Experimental Medicine at Petrograd has been investigating eighty-one endemic foci during the last three years, and has found that infection of the skin transmits the bubonic form of plague, while droplet infection is responsible for the pneumonic. The plague bacillus survives for six months in winter in human cadavers and animal carcasses. In summer it survives only a month, on account of the putrefaction. Wild rodents are the reservoirs of infection, but camels become infected and can start an epidemic in human beings. The geographic distribution and parasitology of wild rodents are extremely important for the study of endemic plague.

Annales des Maladies Vénériennes, Paris

13: 417-496 (June) 1923

*Latent Syphilitic Encephalitis. Cestan and Riser.—p. 417.
The Previous Treatment in 100 Cases of Syphilis. Leredde and Loiselet—p. 427.

Latent Syphilitic Encephalitis.—Cestan and Riser report the case of a man without mental symptoms and with only the Argyll Robertson sign and slight anomalies in the tendon reflexes to suggest general paralysis, aside from findings characteristic of syphilis in the cerebrospinal fluid. Necropsy after intercurrent pneumonia revealed typical lesions of general paralysis in meninges and brain. The practical conclusion is that prognosis should be guarded in cases of syphilitic meningitis five or ten years after contamination, as there may be a latent encephalitis. Treatment should be vigorous and persevering, as the encephalitis may develop at any moment.

Annales de Médecine, Paris

13: 495-610 (June) 1923

*Primary Alkaline Lithiasis. A. Gosset and W. Mestrezat.—p. 495.
*Exacerbations in Pulmonary Tuberculosis. R. Burnand.—p. 526.
*Secondary Epitheliomatous Endocarditis. E. Rist and J. Rolland.—p. 538.
*Diverticulitis. R. Bensaude, A. Cain and P. Hillemand.—p. 547. Cont'n.
*The Double Electrocardiogram. R. Lutembacher.—p. 575.
*Primary Heart Failure in Exophthalmic Goiter. G. Bickel.—p. 593.

Tendency to Production of Alkaline Calculi.—Gosset and Mestrezat protest against the general assumption that alkaline calculi are secondary to local infection. In some families there seems to be a tendency to an alkaline dyscrasia, the body fluids giving alkaline reactions and depositing calculi, a primary phosphate lithiasis. In a case described in detail, the large pelvic calculus was homogeneous, and composed exclusively of phosphate and calcium carbonate. The woman's mother had voided similar alkaline calculi, and her son's urine at times was turbid with phosphates and ammonium urate. A systematic effort was made to transform this alkaline dyscrasia, and charts are given of the various drugs tested on patients of this category and on the normal. They found that sodium sulphate cleared up the urine, promoting elimination of the phosphates. They gave 5 gm. in a glass of water, before breakfast, for five days, twice a month. The second month, 1 gm. of boric acid (in two doses) was given, instead of the sodium sulphate, for a single five day period. They cannot explain the mechanism of the remarkable benefit from sodium sulphate, a neutral salt. The urea content of the blood dropped from 1.5 to 0.62 in less than six weeks.

Exacerbations of Pulmonary Tuberculosis.—Burnand discusses the exacerbations in the course due to congestion, to the progress of the disease, to pleurisy, to intercurrent disease, and especially to miliary phases. He calls the latter the *poussée granulique*, and comments on its grave prognosis when the fever keeps up.

Epitheliomatous Endocarditis.—In the course of general glandular metastasis, four years after removal of the cancerous uterus, endocarditis developed in the right heart, with fatal thrombosis. The vegetations of the endocarditis contained cancer cells, an actual "neoplastic endocarditis." Rist and Rolland have been unable to find any case on record analogous to this. The case is interesting further because the recurring hemoptysis—the first symptom from the metastasis—had been ascribed to latent tuberculosis, but necropsy revealed cancer emboli in the lungs.

Diverticulitis.—This long study of the diverticula of the large intestine is based on twelve cases of diverticulitis. There is no certain cure, medical or surgical; resection is not always practicable. Rest, heliotherapy or the ultraviolet rays should be applied as adjuvants when practicable. A bibliography is appended.

The Electrocardiogram.—Lutembacher explains that the electric variation accompanying the impulse forks after passing through the bundle of His, so that instead of the electrocardiogram being single, as before, it is then a picture of two electric effects. It should be called the electrocardiobigram. The tracing affords no information as to the contraction of the ventricle, because the tracing is the sum of two opposing effects which partially annul each other.

Sudden Death in Exophthalmic Goiter.—Bickel reports primary arrest of the heart action in two women with exophthalmic goiter during a paroxysm of intense hyperthyroidism, with severe precordial pain spreading to the left arm, diarrhea, and rapid changes in the type of the arrhythmia. The next morning the patient was quiet and said she felt better, but suddenly the heart stopped beating. Cyanosis followed and respiration gradually stopped. Necropsy revealed nothing to explain the sudden fatality. Bickel ascribes it to an excessive discharge of the toxic secretion from the thyroid, sensitizing and upsetting the balance in the central as well as in the sympathetic and parasympathetic nervous system. He notes further that digitalis had been administered in both cases; one woman had taken 0.1 gm. of digitalis leaves for three days, the other, 0.08 gm. for one day. The cases show that fibrillation of thyroid origin must be considered. Etiologic treatment is the more necessary, as it has sometimes succeeded in arresting this persistent form of arrhythmia.

Archives de Médecine des Enfants, Paris

26: 393-456 (July) 1923

Antiserums and Vaccines in Treatment of Pneumonia in Children. M. D'Oelsnitz and L. Colle.—p. 393. Cont'd.
Activation by Manganese of Assimilation. J. Camescasse.—p. 406.
*Congenital Dystrophy of Fibro-Elastic Tissue. J. M. Macera.—p. 412.
Banti's Disease in Boy Aged 10. M. de Meuron.—p. 416.
*Diabetes in Children. M. Lassalle.—p. 423.
The Hygienic Factors in Rickets. J. Comby.—p. 428.

Congenital Dystrophy of Fibro-Elastic Tissue.—The infant had inguinal and umbilical hernia and also bilateral hernia of lung tissue. The case was summarized when published elsewhere.

Diabetes in Children.—Lassalle thinks that diabetes in infants is comparatively common, but when symptoms from it appear, we label them with some other name. He declares that there would be many surprises if, instead of feeding starch, we tested the urine for sugar. In a case described, the young breast-fed infant vomited twice after each feeding; the liver was large and the skin extremely dry. At the age of 1 year, with good general condition and appetite, the infant was constantly losing weight. The urine contained 28.5 gm. of sugar and 5 gm. of nitrogen, with traces of acetone, diacetic and oxybutyric acids. He put the infant on a strict diabetic diet, and she increased 350 gm. in weight before the end of the week, and the sugar disappeared. The child is now 4 years old, and seems well and strong, but she has had to be kept constantly on a diabetic diet. The intake of carbohydrates was cautiously increased to a certain proportion, but any amount beyond this brought the sugar back every time. No drugs have been given, nothing but small doses of glycogen occasionally. In another case, a boy, aged 6, in a gouty family, presented symptoms suggesting congestion of the liver at first, but unmistakable diabetic coma speedily

followed. The child was very thin, the skin dry and pimply. The diabetes was probably of several years' standing but had not been recognized. In this and several other cases described, the loss of weight with good appetite, and the dryness of the skin were almost the only signs of disturbance. There was no polydypsia or polyuria. The family history may give the clue. In a group of four diabetic infants from poor families, syphilis was probable, and all had grave gastro-enteritis. One died in convulsions. The fate of the others is not known.

Bulletin de l'Académie de Médecine, Paris

89: 679-705 (June 26) 1923

Associated Micro-Organisms in Pulmonary Tuberculosis. M. Letulle and P. Halbron.—p. 690.
*Experimental Intracardiac Injections. K. Djenab and A. Mouchet.—p. 697.
Obstruction of Common Bile Duct by Ascarides. Le Roy des Barres.—p. 701.

Intracardiac Injections.—Puncture of the ventricle or the mere touch of the needle caused the blood pressure to decline. This decline occurred in rabbits even after the vagi and depressors had been severed. The size of the needle seemed immaterial.

90: 1-34 (July 3) 1923

Latent Appendicitis Without Pain. C. P. Caplesco.—p. 29.
*Reflexes in the Respiratory System. E. De Somer.—p. 32.

Reflexes in Respiratory Apparatus.—De Somer describes a reflex between the trachea and larynx, between the nose and larynx, and between the lung and larynx, which he has discovered in dogs under certain conditions.

Bulletins de la Société Médicale des Hôpitaux, Paris

47: 1009-1049 (June 29) 1923

Insulin in Treatment of Diabetic Coma. Sézary, et al.—p. 1010, p. 1033 and p. 1036.
Necessity for Heliotherapy in Paris Hospitals. P. F. Armand-Delille.—p. 1015.
*Recurring Persistent Hiccup. Le Blaye and Forget-Urion.—p. 1018.
Sedimentation of Erythrocytes in Acute Infections. T. Mironesco.—p. 1022.
Erythromelalgia in Two Syphilities. E. May and P. Hillemand.—p. 1024.
*Subacute Venous Septicemia. Raynaud, Lacroix and Boutin.—p. 1030.
Aneurysm of Arch of Aorta. H. Grenet and Peignaux.—p. 1042.
*Radial Paralysis from Serum Sickness. J. A. Sicard and Cantaloube.—p. 1046.

Recurring Persistent Hiccup.—The man had two attacks of persistent hiccup in two years; five or six days after the second attack, his daughter developed severe epidemic encephalitis.

Subacute Venous Septicemia.—The septicemia in the man had developed by five small successive foci of phlebitis, with hemoptysis, and recovery followed the use of an autogenous vaccine.

Radial Paralysis After Serum Sickness.—Diphtheria antitoxin had been used in one of the three cases reported, and antitetanic serum in the others. The intense serum sickness had evidently induced some local congestion at the points where the nerve passing through some narrow passage could be compressed. Sicard coins the term "neurodocitic" to express this origin for the nervous affection, from the Greek term for "containing."

Gynécologie et Obstétrique, Paris

7: 449-527 (June) 1923

*Mechanism of Placental Separation. F. Commandeur and L. Chapuis.—p. 449.
*Elderly Primiparas. R. Remmelts.—p. 476.
*The Theories on Menstruation. Jean-Robert Henry.—p. 483.
*The Cicatrix After Cesarean Section. J. L. Audebert.—p. 487.
*Menorrhagia in Girls. E. Douay.—p. 501.

Mechanism of Separation of Placenta.—Theories of the histologic mechanism of detachment of the placenta and membranes in the course of delivery are discussed, with eighteen illustrations.

Elderly Primiparas.—Remmelts states that of the 5,915 primiparas with normal pelvis delivered at the Amsterdam maternity since 1892, for those who were over 24 years old, the duration of labor averaged from nineteen to thirty hours. The average under this age was only sixteen or seventeen hours and a fraction. A similar regular increase in the number of forceps extractions and of cases of albuminuria and of eclampsia, after the age of 24, is even more clearly manifest in his charts.

Theories of Menstruation.—Henry examined the ovaries removed from regularly menstruating women, at different phases of the menses, and found the conditions in the ovaries extremely variable. Recent corpora lutea of different ages or no developing corpus luteum were found in different women.

The Cicatrix After Cesarean Section.—Audebert concludes from four personally observed cases and thirty-four from the records, that muscular regeneration with dependable tissues is common, even when there had been suppuration in the cicatrix. In only 14 per cent. of the total thirty-eight was the cicatrix fibrous. But this occurred in some cases when everything had seemed favorable for physiologic regeneration. All that the clinician can say is that in 73 per cent. in this series the muscular regeneration was perfect. The records to date show an average of rupture in a subsequent pregnancy in about 6 per cent.

Menorrhagia in Young Girls.—Douay outlines hygienic and medical measures for cases of excessive menstrual hemorrhage not long after puberty. When all measures, including organotherapy fail, roentgen rays applied from without may relieve. A single sitting generally suffices, three hypogastric applications of 8 H units at each field, or the dose can be fractioned. As there is liable to be transient congestion, he makes the application after a menstrual period. Menstruation may be totally arrested for several months, and then may return apparently normal. The girl may bear healthy children later, but it is not fair to ascribe eventual sterility to this treatment, as, in the circumstances in which it is applied, it is the last resource before hysterectomy.

Journal de Chirurgie, Paris

21: 673-804 (June) 1923

*Access to Lower Esophagus. R. Grégoire.—p. 673.
*Abscess in the Spleen. C. Lenormant and J. Sénèque.—p. 685.

Access to Lower Esophagus and Fundus of Stomach.—The special feature of Grégoire's technic is that both the pleura and the peritoneum are left intact. The incision is in the left side of the back, near the spine, running from the seventh nearly to the twelfth rib, and then curving forward. This flap being lifted up and the diaphragm incised and turned back, exposes the entire cardia, fundus and esophagus. Three cases are described, with illustrations.

Abscess in the Spleen.—In the 27 cases of suppuration in the spleen since 1907 compiled by Lenormant and Sénèque, all recovered of the 11 evacuated by way of the thorax, but one died in the 10 reached through the abdomen. The one case with retroperitoneal access terminated in recovery. Splenectomy was applied to 4 patients, with 3 deaths, all in cases of already diffuse peritonitis.

Journal d'Urologie Médicale et Chirurgicale, Paris

15: 417-508 (June) 1923

*Structure of Chimpanzee's Testes. Retterer and S. Voronoff.—p. 417.
Steinach Operation. K. Sand.—p. 431.
*Pregnancy Pyelonephritis. J. Martin.—p. 445.
Thrombosis of Renal Vein; Nephrectomy; Recovery. G. Marion.—p. 455.
Correction of Urethroperineal Fistula. M. Jungano.—p. 459.

Structure of Testes of a Chimpanzee.—Retterer and Voronoff implanted the testes of the monkey into two men, and here describe the structure of scraps retained for examination. Although the animal was 5 or 6 years old, necropsy not long after showed that the period corresponding to puberty had not been reached.

Pregnancy Pyelonephritis.—Martin reports a personal case and reviews 10 cases in which the pregnancy was interrupted, with immediate excellent results in 7, and 10 cases in which nephrostomy was applied. Abortion followed in 3 cases; it might have been better to have emptied the uterus at once. In 4 of the 10 cases the pregnancy proceeded to term. In 3 cases conditions compelled nephrectomy not long after; the kidney disease had probably preceded the pregnancy. He

relied on nephrotomy in his own case, and the woman recovered. Convalescence was disturbed by intermittent hemorrhage from the wound, but recovery followed.

Médecine, Paris

4: 653-728 (June) 1923

*Electroradiology and Physiotherapy in 1922. A. Zimmern.—p. 653.
Campaign Against Cancer in France. J. Bergonié.—p. 668.
*Hemorrhagic Metritis and Radiotherapy. R. Proust.—p. 670.
*Treatment of Facial Neuralgia. J. A. Barré.—p. 676.
Roentgen Investigation of Spine with Pains in Lumbar-Sacral Region. A. Léri and N. Péron.—p. 680.
Thorium Treatment of Chronic Rheumatism. M. P. Weil.—p. 687.
*Treatment of Facial Paralysis. G. Bourguignon.—p. 692.
The Erythema Dose in Deep Radiotherapy. I. Solomon.—p. 698.
Lesions on Limbs from Sports. A. Mouchet.—p. 700.
Heliotherapy and Meteorology. A. Rosselet.—p. 705.
*Physical Measures in Treatment of Phlebitis. P. Quiserne.—p. 709.
*Vichy Waters in Cases of Chronic High Blood Pressure. Sérégé.—p. 715.
*Mineral Waters in Anaphylactic Sensitization. A. Mougeot.—p. 721.
*Supplement. Basal Metabolism. A. Blanchetière.—pp. 1-26.

Electroradiology and Physiotherapy in 1922.—Zimmern regards the creation of a cancer commission in the ministry of hygiene as great progress. Another advance is Solomon's R unit in place of the H unit in radiology. The R unit is based on the ionization produced by a given amount of radium element. He says that the doctrine of a settled massive "castration dose" or "cancer dose" has proved untenable, as individual susceptibility varies so widely. The French school spreads the cancer dose over seven days, never longer, for fear of sensitizing the normal tissues and immunizing the cancer cells. He reviews the reports of successful radiotherapy in cancer of the larynx, in scleroderma, in syringomyelia, etc., but warns against trusting too much to it for cancer of the tongue, breast, submucous uterine fibromas and polyps. The ovary is most susceptible as the menopause approaches, and myomas, during their waves of rapid development. The roentgen rays may shorten coagulation time by 25 to 50 per cent.—important in treatment of hemorrhagic conditions. He mentions the intensiometer, a gage which allows constant oversight of the intensity of the roentgen rays.

Radiotherapy in Hemorrhagic Metritis.—Proust remarks that the treatment of hemorrhagic metritis entered on a new era with roentgenotherapy and radium therapy. He gives 4 millicuries at a single sitting for young virgins, placing the tube in the uterus after complete dilatation and exploratory curettage. At the menopause, the invading angiosclerosis with the metritis gives radium its best results. During the reproductive period, the danger of sterilizing the woman must be kept in mind.

Ionization Treatment of Neuralgia.—Barré ionizes aconitin in the treatment of facial and other neuralgias, giving from ten to eighty (twenty to forty-five minutes) applications every day or second day, with a 15 to 20 ma. current. In fifteen cases of facial neuralgia in which this treatment has been applied since 1917, nine were much improved or cured. In the others, the pain was not true facial neuralgia. In some the pain returned in a few months, and the patients requested repetition of the treatment. The positive electrode is moistened with a solution of aconitin nitrate, 0.25 mg. to 125 c.c. of water.

Treatment of Facial Paralysis with Ionization of Potassium Iodid.—Bourguignon states that recovery was complete in a month in all cases in which the nerve was still excitable. In seven cases, electric tests were negative, but all recovered between the tenth and fifteenth sitting. He uses the soft parts of the eye and ear for the passage of the current, with the positive electrode high at the back of the neck.

Treatment of Phlebitis.—Quiserne outlines physical measures which hasten restoration of normal conditions after phlebitis.

Spa Treatment of High Blood Pressure.—Sérégé lists the indications with hypertension for a course of treatment at Vichy.

Action of Mineral Waters on Anaphylactic Sensitization.—Mougeot reports experiments with guinea-pigs sensitized against horse serum. The waters of certain mineral springs seemed to protect the animals against anaphylactic shock.

Basal Metabolism.—Blanchetière analyzes the physiologic and pathologic variations of basal metabolism, with an extensive bibliography.

Nourrisson, Paris

11: 209-288 (July) 1923

*Prophylaxis of Inherited Syphilis. V. Hutinel.—p. 209.
*Essential Stridor in Infants. A. B. Marfan and Turquety.—p. 224.
The Infant Ward at Saint-Louis Hospital. Renault et al.—p. 229.
*Milk from Scurvy Standpoint. E. Rousseau.—p. 237.
*Oxygen in Pneumonia in Infants. L. Ribadeau-Dumas et al.—p. 243.
Present Status of Eczema in Infants. A. B. Marfan.—p. 258.
Suppuration in Cervical Glands and Abscesses Around the Pharynx in Infant. G. Blechmann and G. Lory.—p. 273.

Prophylaxis and Management of Inherited Syphilis.—Hutinel refers in particular to infants without proper homes. He urges more dispensaries, open at convenient hours, for the pregnant; convalescent homes after delivery; and small district centers for the suspected infants, with treatment all along the line, even for older children developing suspicious lesions.

Essential Expiratory Stridor in Infant.—Necropsy at the age of 11 months failed to reveal anything to explain the permanent, loud expiratory stridor.

Milk from Scurvy Standpoint.—Rousseau recalls that the vitamin C is the most sensitive of all to the action of oxygen, heat and cold. All substances containing vitamin C, even lemon prepared in a vacuum, lose it on standing. Marfan declares that all condensed milk cans should be dated, and Rousseau's research indicates that nothing of the kind should be used for infant feeding that has been made longer than two weeks.

Continuous Oxygen Treatment in Pneumonia in Infants.—Necropsy findings show that lack of oxygen is only one of the many elements in the clinical picture. Oxygen does not directly combat intoxication, or check the progress of the lesions. But in case of inflammatory edema it may tide the patients past the critical hour, and give a chance for edema to be resorbed. The differential diagnosis is so difficult, that it may be wise to try the oxygen in case of doubt. Ribadeau-Dumas and his co-workers use a box like an incubator for the oxygen chamber for the infant, leaving it in the box for alternate hours. Twenty infants were given this treatment, being placed in the box whenever cyanosis became apparent. The change for the better in the complexion, spirits and appetite was so pronounced that the mothers clamored for it, but the effect, after all, was only symptomatic, except when it proved actually life-saving in the edema cases.

Paris Médical

13: 525-548 (June 16) 1923

Gynecology in 1923. L. Houdard.—p. 525.
Indications for Curetting the Uterus. P. Guéniot.—p. 531.
Obstetrics in 1923. L. Cleisz.—p. 534.
Syphilis of the Ovum, of the Fetus and of the Membranes and Placenta. Lévy-Solal.—p. 537.
*Treatment of Vomiting of Pregnancy. C. L. Urriola.—p. 544.

13: 549-564 (June 23) 1923

Carbon Dioxid Snow in Treatment of Angiomas. Lortat-Jacob and P. Legrain.—p. 549.
Perforation of Gastric Ulcer. Five Cases. A. Guillemin.—p. 554.
Trauma and Efforts at Abortion as Factor in Malformations. A. Feil. p. 559.

13: 565-580 (June 30) 1923

The Stigmata of Tardy Inherited Syphilis. B. Barker Beeson.—p. 565.
Psychopathic Day or Night Pollakiuria. Chavigny.—p. 566.
Signs of Perforation of Gastric or Duodenal Ulcer. J. Braine.—p. 568.
Syphilitic Anergy. M. Lelong.—p. 575.
Bismuth in Treatment of Syphilis. A. Galliot.—p. 577.
Strangulation of a Lipoma in Front of a Femoral Hernia. G. Moutier. —p. 579.

Treatment of Uncontrollable Vomiting of Pregnancy.—Urriola writes from Panama to report success by the administration of serum obtained from the umbilical cord before the separation of the placenta. He gives the details of eight cases in which the previously intractable vomiting subsided after one, two or three injections of 5 or 6 c.c. of this serum.

Presse Médicale, Paris

31: 605-612 (July 11) 1923

The Ratio Between Nucleus and Plasm. A. Policard.—p. 605.
*Blocking the Mesenteric Plexuses. M. Roussiel.—p. 606.

Blocking the Mesenteric Plexuses.—Roussiel explains how the mesenteric plexuses, the inferior and superior, the lumbar aortic, the renal, and the solar plexus can all be blocked by a single injection, injecting the anesthetic close to the trunk of the superior mesenteric artery at the point where the artery leaves the duodenum to pass between the layers of the mesentery. Test injection of a stain shows all the abdominal sympathetic plexuses colored, the fluid spreading through the subperitoneal cellular tissue, following the course of the superior and inferior mesenteric arteries, the aorta and the celiac axis. The anesthesia was ideal in the one case reported. The ileus was grave, of eight days' duration, and Roussiel does not wait for further confirmation to call attention to this single injection method.

21: 613-624 (July 14) 1923

*Fatal Case of Asthma. A. Lemierre, M. Léon-Kindberg and J. Lévesque.—p. 613.
Present Status of Lymphogranuloma. M. Nathan.—p. 616.

Fatal Case of Asthma.—The mucomembranous spasmodic bronchitis in the case described was a form of asthma. The man, aged 58, had been seized with intense dyspnea in the midst of apparent health, and for six weeks the dyspnea kept recurring, with paroxysms of coughing in which he expelled castlike formations resembling cooked vermicelli. After a pause of a month the dyspnea returned, and proved fatal the third week. Necropsy showed the bronchi plugged with these castlike formations, containing numerous Charcot-Leyden crystals and eosinophil granules. Comparison with similar cases on record, the sudden onset, the evolution by successive attacks, the absence of manifestations suggesting infection, and other features confirm the asthma nature of the syndrome.

21: 625-636 (July 18) 1923

*Irradiation of the Spleen in Pulmonary Tuberculosis. I. I. Manoukhine.—p. 625. Reply. Trémolières et al.—p. 637.
Ileus from Pericolitis. P. Rochet and Mallet-Guy.—p. 627.

21: 637-648 (July 21) 1923

Insulin in Diabetes. L. Blum and H. Schwab.—p. 637.
Sterility and the Roentgen Rays. J. Belot.—p. 642.
Recent Research on Asthma of Anaphylactic Origin. P. Pagniez.—p. 643.

Irradiation of the Spleen in Treatment of Pulmonary Tuberculosis.—Manoukhine discusses the variations in the leukocyte count during and following this indirect roentgenotherapy in pulmonary tuberculosis.

Schweizerische medizinische Wochenschrift, Basel

53: 613-636 (June 28) 1923

Dilatation of Esophagus of Spastic Origin. H. Starck.—p. 613.
*Blunders in Diagnosis of Cancer in Bone Marrow. E. Hanhart.—p. 619.
*Diphtheria of Esophagus. W. H. Gonin.—p. 625.
*Central Corneal Ulcer. J. Strebel.—p. 626.

Blunders in Diagnosis of Cancer of the Bone Marrow.—Hanhart states that in 30 cases of cancer metastasis in the bone marrow in the Zurich hospitals, the clinical picture had been that of paraplegia dolorosa in 2 cases; spontaneous fracture in 8; neuralgia in 14; and in 6 the lesion had run an almost latent course. In 2 cases the primary cancer was never found. In 19 of the 24 manifest cases, the diagnosis had been incorrect, the cases having been labeled sciatica (8), spinal syphilis (3) and tabes, brain tumor, meningitis, coxitis, arthritis or multiple myeloma, one case each. The most instructive symptom is the exceptional painfulness. Bilateral pains suggesting symmetrical sciatica, herpes, or brachial neuralgia are very suspicious of metastasis of unsuspected cancer. In half of his cases the blood picture was normal, and sometimes even the roentgen-ray findings were negative. Metastasis occurred in the bone marrow five, nine and nineteen years after a small mammary cancer had been removed, in three of his cases, and in one case on record the interval was twenty-three years. The variability in the symptoms from the bone metastasis, the long remissions for months or years, the rapid consolidation after the spontaneous fracture, are all characteristic. There may be unsuspected extensive metastasis in the bones at the time the primary cancer is removed, as in some typical cases described.

Diphtheria of the Esophagus.—Necropsy revealed the pharynx, esophagus and part of the stomach of the boy, aged 11, nearly filled with the false membranes of diphtheria. Stupka has compiled nine cases in which cicatricial stenosis followed diphtheria of the esophagus, an indirect consequence of the disease.

Treatment of Perforated Corneal Ulcer.—Strebel has always found that a centrally perforated corneal ulcer healed smoothly and promptly under a collargol-atropin salve, without requiring cauterization or a plastic operation. In two of three cases in the last five years, the defect had healed over by the second day. In one of the cases the corneal ulcer was secondary to acne of the face. In such cases the corneal ulcer will not heal until the acne is cured.

Chirurgia degli Organi di Movimento, Bologna

7: 225-412 (June) 1923

*Autografts Drawn Through Bone. A. Bertocchi and C. F. Bianchetti.—p. 225.
*Cinematized Amputation Stumps. Delfor Del Valle, G. Bosch Arana, and F. Wildermuth.—p. 244.
*Metal Screws for Patella. R. Sacco.—p. 257.
*Embryology of Articulations. G. Faldino.—p. 288.
*Influence of Metal on Bone Production. L. G. Gazzotti.—p. 311.
*Fracture of Humerus. M. Bufalini.—p. 329.
Evolution of Bone Implants. F. Satta.—p. 345.
Anatomic and Functional Changes in Muscle Shut Off From Blood Supply. F. Marinelli.—p. 367.
Case of Achondroplasia with Defective Ossification of Skull, Clavicles and Fingers. Montanari.—p. 379.
Giant Cell Tumors in Tendon Sheaths. L. Durante.—p. 392.
Feet with Only Two Toes. R. Minervini.—p. 403.

Tendon and Fascia Autografts Drawn Through Channel in Bone or Joint.—Bertocchi and Bianchetti report that in eight rabbits a strip of fascia or tendon was drawn through a passage bored through the shaft of the femur, and in ten through passages bored through the femur and tibia, to allow crossing of the autografts like the natural crucial ligaments. The results were surprisingly good; the joint functioned well, and the tendon never displayed any tendency to ossification, notwithstanding this intimate contact with the bone. The autografts seem to grow to the periosteum, especially tendon tissue. Only a few foci of necrosis were found in any of the autografts. The Achilles tendon was the one generally used.

Further Triumphs in Field of Cinematized Artificial Arms.—Bosch Arana and Del Valle remark that the motor force and excursions of the cinematized stump are greater, the broader the area of muscle involved in the new motor. They describe an artificial hand adapted to a stump cinematized by their method, with illustrations. The fingers are under volitional control both when the arm is flexed and extended. One of their patients after amputation of both forearms is now able to feed and wait on himself, and has resumed his usual mode of life.

Ultimate Outcome of Screw Treatment of Fractures.—Sacco's nineteen cases were all transverse fractures of the patella or olecranon, and these patients—out of a total of fifty-three cases of fracture of the patella and eight of the olecranon—were reexamined from five to seven years later. The outcome was found excellent in all; including one case in which Putti's narrow metal band was used instead of wire or screws for *cerclage* of the fractured patella. The work issues from the Rizzoli Institute, and is profusely illustrated. The verdict is extremely favorable for this screw method of treating these transverse fractures. The metal had to be removed later in only 19 per cent. of the total; the bone does not seem to suffer from the presence of the one or two long, narrow, Lambotte screws. After being driven in they are tightened with a screw driver till the head fits against the bone. When one screw is used for the patella, a nut may be screwed on the tip.

Development of Joints.—In his experiments Faldino implanted in the rabbit eye part of the leg from a rabbit embryo about 2 weeks old. This is his fourth publication on the morphogenesis of joints.

Behavior of Bone in Contact with Metal.—Gazzotti buried small cylinders of various metals in the tibia or femur of dogs. The less the change in the metal, the greater the proliferation of bone. Iron and copper rusted and tarnished, but nickel and tin persisted practically unmodified. The physical qualities, easy manipulation and inexpensiveness turn

the scale, he says, in favor of a coating of tin for the metal devices applied directly to the bone.

Fracture of Surgical Neck of Humerus.—Bufalini comments on the drawbacks of the common methods of treating these fractures, and extols the superiority of his cast method. The arm is held flexed at the elbow at a right angle to the trunk, in abduction and outward rotation.

Policlinico, Rome

30: 793-823 (June 18) 1923

*Hydatid Cyst in the Lung. C. Antonucci.—p. 798.

Hydatid Cyst of the Lung.—Antonucci suggests reduction of the cyst without drainage, after suturing it to cause approximation of the opposing surfaces of the cyst cavity. Then the lung should be compressed at once with an artificial pneumothorax.

30: 825-855 (June 25) 1923

*The Cerebrospinal Fluid in Rabbits. F. Bonfiglio.—p. 825.
*The Wassermann Reaction in the Cerebrospinal Fluid. P. Fornara.—p. 830. Begun p. 793.

Cerebrospinal Fluid in Normal Rabbits.—Bonfiglio refers to recent research on this fluid in syphilitic rabbits, saying that the conclusions that have been deduced therefrom are invalid, as there are no normal standards to compare them with. His own research has shown that the findings ascribed to the syphilis are normal characteristics of the fluid in some rabbits (seven out of nineteen).

The Wassermann Reaction in the Cerebrospinal Fluid.—Fornara's extensive review of international literature and his personal experience have convinced him that a nonspecific Wassermann reaction in the cerebrospinal fluid is due to qualitative and quantitative changes in the globulin content. In three cases of tuberculous meningitis and one case of paraplegia from compression in Pott's disease, the Wassermann reaction in the spinal puncture fluid was pronounced, although nothing at the time or later suggested possible syphilis.

30: 857-887 (July 2) 1923

*The Urine-Hemolysis Index. L. Scalas.—p. 857.
*Degeneration of the Corpus Callosum. P. Mariconda.—p. 860.
Hydrocyanic Acid in Disinfestation of Ground Before Planting. M. Giosefi.—p. 862.

Hemolytic Power of the Urine in Liver Disease.—Scalas dilutes urine until the action of the natural antihemolysins is annulled. The amount of distilled water required for this forms what he calls the urohemolytic coefficient. In the normal, this index is a constant 1:6; with nephritis it is nearer 6:1. Scalas in chronic liver disease found it decidedly abnormal. He describes the technic and detailed findings in nineteen cases. He agrees with Amati that the antihemolysin is a lipoid which seems to protect the blood corpuscles. It acts independently of the chlorids in the urine, resists boiling, and gives the reaction for cholesterin.

Degeneration of the Corpus Callosum.—Mariconda analyzes two cases of what he calls Marchiafava's disease. The men, aged 43 and 60, had died two or three days after they had fallen in a comatose condition while in ordinary health. The older man had had similar transient attacks before. Necropsy disclosed alcoholic degeneration of the corpus callosum. This was evidently the primary lesion.

Rivista di Clinica Pediatrica, Florence

21: 385-448 (July) 1923

*Origin of Bilirubin. V. Zamorani.—p. 385.
*Oxyuriasis. G. Artusi.—p. 405.
*Culture Mediums for Diphtheria Bacilli. T. Nigro.—p. 425.

Origin of Bilirubin.—Zamorani injected by the vein hemolyzed blood from one dog into another dog with a bile fistula. The bile thereafter showed extreme dissociation of its elements. The facts observed suggest that physicochemical conditions determine the composition of the bile, depending on the material for it available at the moment. He recalls that bile begins to form in the fetus by the third month, and at birth even the umbilical cord blood shows high bilirubin content. This hyperbilirubinemia persists for a few days after birth, so that jaundice in the new-born must be regarded as simply an exaggeration of normal phenomena. It is not hemolytic jaundice, because there is no preceding destruction of blood corpuscles, but the exaggerated production of bile, before the organs have adapted themselves to extra-uterine life, readily explains icterus neonatorum.

Oxyuriasis.—Artusi presents evidence that the oxyuris ova can be developed in the human intestine without passing through the stomach. By killing off the young systematically, as they emerge from the ova, the helminthiasis will be conquered in time. The vermifuge must be taken regularly for two months at least, aided by a cold, profuse enema every night, containing lime water or aluminum acetate. This should be preceded with a cleansing enema containing sodium bicarbonate, to dissolve the mucus which protects the helminths.

Differentiation of Diphtheria Bacilli.—Nigro reports comparative bacteriologic tests with various culture mediums in sixty cases of suspected diphtheria. He found that on Pergola's serum-egg yolk medium the diphtheria bacilli grew luxuriantly while other bacteria were inhibited. This is a mixture of 50 c.c. of normal blood serum (beef, horse, etc.) with one egg yolk and 0.02 gm. of potassium tellurite, with 50 c.c. of an 0.8 per cent. solution of sodium chlorid, or 50 c.c. of a 1.5 or 1.7 per cent. solution of agar.

Deutsche Zeitschrift für Chirurgie, Leipzig

170: 289-426 (May) 1923

*War Wounds of the Skull. W. Sudhoff.—p. 289.
*Congenital Stenosis of the Pylorus in Adults. L. Heidenhain and G. B. Gruber.—p. 330.
Action on Blood Pressure of Procain with Epinephrin. O. Wiemann.—p. 388.
Enterocystoma in Cecum Wall. G. Lotheissen.—p. 394.
Aseptic End-to-End Anastomosis of Large Intestine. F. C. Lee.—p. 402.
*Snapping Knee. E. Wild.—p. 408.
Volvulus After Spastic Ileus. H. Steindl.—p. 413.
Isolated Stab Wound of Gallbladder. H. May.—p. 422.

War Wounds of the Skull.—Sudhoff reviews the experiences at Leipzig in 133 operations on the skull in eighty-eight wounded soldiers. Pedunculated bone-periosteum flaps healed solidly over one very large defect, though the skin sloughed. There was very little if any improvement in the cases of paralysis; traumatic epilepsy—which was present in 22 per cent.—was influenced more favorably.

Congenital Conditions as Factors in Gastric Disturbances in Adults.—Heidenhain gives details of seven cases in which years of stomach disturbances seem to be the result of congenital stenosis of the pylorus which had apparently corrected itself in infancy, spontaneously or under medical measures alone. The resulting disturbances in adults cannot be distinguished from gastric or duodenal ulcer. The hypertrophic-spastic stenosis of the pylorus in infants, the congenital stenosis of the pylorus in adults, and gastric ulcer form a group linked by a constitutional neurotic element. The cases cited teach the importance of resecting the pyloric ring in every case of unmistakable stenosis of the pylorus. Gastro-enterostomy alone is not enough, and shutting off the pylorus in addition seems to entail some chronic irritating influence which causes excessive peristalsis and pains from spastic contracture. Gruber presents the confirmatory findings at the operation in some of these cases, and in several cadavers.

Snapping Knee.—Wild remarks that removal of the semilunar cartilage involved has always cured the anomaly. In his case, the cartilage had been torn. The anomaly generally follows trauma, but it may develop from disease or exostosis.

Jahrbuch für Kinderheilkunde, Berlin

102: 129-256 (June) 1923

Tuberculosis in Schoolchildren. J. Peiser.—p. 129.
*Rickets and Tetany. P. György.—p. 145.
*Sugar Content of Cerebrospinal Fluid. B. Steiner.—p. 173.
*Circulation During Exercise. K. Benjamin.—p. 203.
*Prophylaxis of "Children's Diseases." F. von Torday.—p. 213.
*Requirements of Weakly Infants. J. Schoedel.—p. 227.

Rickets and Tetany.—György's research has apparently demonstrated that the tendency is to acidosis in rickets, and to alkalosis in tetany. The phosphates are scanty in the blood in rickets, while they abound in tetany. The calcium content is low in rickets and very low in tetany, while the blood potassium is normal in rickets and reaches a high figure in tetany. The sugar content in the blood after

injection of epinephrin runs up high in rickets, but in tetany it drops below normal. Tetany might even be called "the negative of rickets," but the two are not antagonistic as they may coexist, and when this occurs it is impossible to cure the tetany without curing the rickets first. He thinks the unknown primary cause—probably of endocrine origin—induces a two-phase reaction, the pendulum swinging from the acidosis to the alkalosis extremes. The "spring hormone crisis" upsets the metabolism and may start the pendulum.

Sugar Content of Cerebrospinal Fluid.—Steiner gives case histories and charts which sustain his assertion that if the sugar content of the cerebrospinal fluid is normal or soon returns to normal, tuberculous meningitis can be confidently excluded. A drop in the sugar content of the lumbar puncture fluid may be the first appreciable manifestation of tuberculous meningitis. Symptoms suggesting meningitis, accompanying a brain abscess, typhoid or other infectious disease, can be differentiated from tuberculous meningitis by the normal sugar findings. On the other hand, the sugar content is always abnormally high with poliomyelitis, tetanus and brain tumor. In one typical case of tuberculous meningitis, from 0.043 per cent. the sugar dropped to zero, in nine days. In a case of brain abscess it increased from 0.055 to 0.08 per cent. in thirteen days, and in two cases of poliomyelitis the figures were 0.0845 and 0.0615 per cent.

Nervous Regulation of the Circulation During Exercise.—This is Benjamin's third article on growth pallor. He explains here the mechanism of the benefit from exercise.

Prophylaxis of Acute Infectious Diseases in Childhood.—Von Torday remarks that measles and diphtheria seem to be now under our control. In 2,000 preventive injections of measles convalescents' serum, it failed to protect in less than 3 per cent., and even here the technic may have been at fault. Professor Bokay of Budapest is now making arrangements to supply convalescents' serum regularly to institutions threatened with measles. But scarlet fever prophylaxis is less promising. Torday on five occasions injected a total of 20 contacts with scarlet fever convalescents' serum, and none developed the disease, but 7 developed it among 92 in an institution, and 3 in Papp's 35 cases in families. The protection proved effectual in 49 other contacts injected and isolated at once. The whole question of scarlet fever is still unsolved. Di Christina's vaccine made from scarlatinal scales, and Tahakashi's subcutaneous injection of blood from scarlet fever children have not found imitators. In conclusion, he mentions that he injected 116 children who had been exposed to measles from two to six days before with 20 c.c. of blood from adults or older children who presumably had had measles at some time. Only 12 developed measles, and it was very slight or rudimentary. He endorses Rietschel's recommendation of this as a valuable aid in prophylaxis for infants and young children in the home, whether or not the effect is to be interpreted as a specific or merely a protein reaction. His final word is that neither active nor passive immunization has proved of any avail against whooping cough.

Requirements of Thriving Substandard Infants.—Schoedel estimates the amount of milk and the intervals between feedings on which 57 infants born below weight were brought up to standard. The child becomes fatigued sucking before it has obtained its quantum, so light feedings may be necessary at first; this helps to improve lactation. When only pumped breast milk is used, there must be eight or ten feedings at first. If the child does not voluntarily take enough, the supplementary amount can be given by tube. His tables confirm anew the superior advantages of the mother's milk for these infants. They should be getting 120 to 150 calories per kilogram. Five weighing from 1,350 to 2,290 gm. gained an average of 12 to 23 gm. daily with intake of 130 to 175 gm. at the end of the second week; 140 to 190, third week; 145 to 210, fourth week, and 150 to 250 gm. sixth to eighth week. Those that thrived on pumped breast milk required 95 to 150 gm. the first week; 140 to 240, second week; 160 to 240 third week; 165 to 235, fourth week, and in the sixth to the eighth week, 165 to 225 gm. per kilogram. The infants were not put to the breast of the wetnurse until after at least two Wassermann tests at weekly intervals. They then took more milk than the above estimated amounts, showing that these amounts had not exceeded the demand.

Monatsschrift für Kinderheilkunde, Leipzig

26: 209-320 (June) 1923

*Sleep in Childhood. H. Aron.—p. 209.
*Repeated Recurrence of Keratomalacia. R. Gralka.—p. 217.
Relations Between Infections of Upper Air Passages and Pyelitis. H. F. Helmholz and F. Millikin.—p. 228.
*Importance of Vitamins for Growth of Bacteria. B. Leichtentritt and M. Zielaskowski.—p. 232.
*Brain Manifestations in Beriberi in Infants. S. Miura.—p. 243.
*Infant Feeding in Dyspepsia. L. Moll.—p. 250.
Diphtheria Mortality and Weather Conditions. Ochsenius.—p. 266.
*Chlorin Metabolism in Exudative Diathesis. H. Opitz.—p. 288.
*Chlorids in Blood of Infants in Relation to Gastric Juice Secretion. W. Schober.—p. 297.
Influenza Osteomyelitis in Infants. H. Zweig.—p. 308.

Sleep in Children.—Aron says that when a child is sleepy in the morning, it is not getting sleep enough. Wakefulness till late in the evening is generally a sign that the child is doing too much brain work or is having too much excitement. Increasing the amount of sleep often has the same effect on the undernourished as increasing the amount of nourishment, as the calories are not used up so much during sleep.

Prevalence of Keratomalacia.—Gralka states that, in 1922, softening of the cornea was encountered in 16 boy and 14 girl infants at the Breslau children's clinic. Nearly all the cases were between March and May, and many of the infants were breast fed in whole or in part. Evidently there was a lack of the fat soluble accessory factor in the breast milk, the mother's food during the pregnancy and lactation having been almost exclusively carbohydrate. In 22 of the 30 cases one or more infections had preceded the keratomalacia. All died but 11; 4 of these were left with good vision in both eyes, 4 in one eye; leukoma developed later in 3 in this group. Treatment was with breast milk, butter-flour mixture and cod liver oil. In most of the cases with a favorable termination, an abrupt increase in weight followed the change to this diet.

Accessory Food Factors as Influencing Growth of Bacteria.—Among the results of the research described was the discovery that the growth of bacteria was hastened and increased by addition of a little lemon juice to the culture medium. This aids in hastening the differential diagnosis of typhoid, colon bacilli and other bacteria.

The Brain in Beriberi in Infants.—Miura reports two cases in which necropsy showed the unmistakable lesions of beriberi with serofibrinous meningitis, while the symptoms had been those of intoxication from breast milk, superposed on those from the beriberi. Probably the diagnosis of "intoxication from breast milk," has often been made in the past when beriberi or meningitis was really responsible for the symptoms.

Vegetable Milk in Infant Feeding.—Moll witnessed good results in acute dyspeptic diarrhea from a temporary change to a mixture of equal parts of a boiled emulsion of sweet almonds, and the whey from 1 liter milk containing 4 per cent. calcium lactate, boiled.

Chlorin in Infant Organism.—Opitz found in children with the exudative diathesis that the chlorid content of the blood fluctuated irregularly within an abnormally wide range. Schober discusses the fluctuations of the chlorid content of the serum and the blood as they correspond to the phases of production of gastric juice.

Zeitschrift für Urologie, Leipzig

17: 193-256, 1923

*Pathology of the Prostate. G. Praetorius.—p. 193.
*Stenosis of Meatus. S. Freylich.—p. 207.

Pathology of the Prostate and Prostatic Urethra.—Praetorius ascribes to loss of elasticity, in the walls of the urethra, the retentions for which the prostate is generally incriminated. The enlarged prostate interferes with the elasticity of the urethra walls, and sets up a vicious circle. If the lumen of the urethra can be stretched to normal, or be enlarged by cutting or cauterization, or by straightening bends, there is no longer any retention. Based on this assumption, he

removes only part of the prostate, and has found this as effectual as total enucleation. He removes one lateral lobe and the middle lobe, but leaves the other lobe intact, and has had no recurrence of retention in the cases thus treated during more than six years.

Pathology of the Meatus.—Freylich discusses strictures, inflammatory swelling, congenital stenosis and neoplasms as causes of narrow external orifice of the male urethra. He cites fifteen instances; the stenosis is congenital in the majority, and is usually accompanied by other malformations. Progressive dilatation generally accomplishes the purpose in the acquired cases, but not with the congenital form; many warn of the possibility of injury from attempts at mechanical dilatation. He cites ten urologists who have published fatalities after it. Burckhardt groups these cases as a rapidly progressive severe form of septicemia. This is scarcely to be feared with meatomy, however, and this should be preferred when practicable. Freylich advises severing the inferior meatus commissure with a delicate curved knife introduced into the meatus. The mucosa is sutured to the skin on each side, thus rendering a retention catheter unnecessary. As a too wide meatus interferes with the functioning of the urinary apparatus, it is best to gage the incision exactly.

17: 385-448, 1923, and Supplement

*Exstrophy of the Bladder. F. Lotsch.—p. 385.
The Calices in Hydronephrosis. H. Haebler.—p. 397.
*The Cystoscope. O. Ringleb.—p. 406.
*Operative Treatment of Hypertrophied Prostate. Wossidlo.—p. 415.
Endothelioma of the Bladder. M. Okazaki.—p. 422.
*The Use of the Urinal. Thilenius.—p. 425.
Epithelioma of Uriniferous Tubuli. Armbruster.—p. 433.
*Supplement: Postgraduate Course on Kidney and Bladder Disease.—pp. 1-74.

Correction of Exstrophy of the Bladder.—Lotsch remarks that the main efforts in this line have been directed toward reconstruction of the receptacle of the bladder, but the danger of stagnation of urine, especially in the large receptacles of the newer methods, is graver than the danger from bacterial invasion. Even before the operation, there is stagnation of urine with exstrophy of the bladder. This damages not only the lining of the receptacle but the kidneys. Five cases are described, with one young man clinically cured and continent to date, eighteen months since the Maydl-Berglund-Müller operations. Lotsch extols the original Maydl method as superior to all others. The main point is to avoid conditions liable to entail a fistula, hence intraperitoneal access is safer. His three patients that died from late peritonitis were an infant and two boys, aged 6; Maydl's caution not to operate before the age of 10 should be heeded.

Improved Cystoscope Technic.—Ringleb remarks that with darkfield illumination Nitze's ideal has been realized, in showing with the cystoscope even a small admixture of pus in the urine issuing from the ureter. He describes how to produce the darkfield by a special way of holding the cystoscope. Another improvement is the use of colored screens for the light, on the same principle as Vogt's light in which the red rays are filtered out. The details of the retina show marvellously under this "red-free light."

Hypertrophy of the Prostate.—Wossidlo analyzes his experiences with 117 operations on the prostate. There was total incontinence afterward in 3 of the 10 surviving after perineal prostatectomy (12 cases). Two are still living and feel in good health, and are continent, of the 3 treated with Voelcker's parasacral method. This seems the best technic for cancer of the prostate. In 2 cases of "prostatism" with a little residual urine and periodical retention, vasectomy seemed to cure completely in one, and in the other the residual urine dropped from 50 to 10 c.c. In 4 other cases with hypertrophy, hard or soft, no benefit was apparent.

The Urinal Question.—The mouthpiece of Thilenius' vulcanized rubber urinal is fitted with rubber sponge tissue to make it cling to the skin. The receptacle for the urine is fastened to the leg during the day, and at night the tube discharges into a vessel. In cases of cerebral hemorrhage, even one night of maceration from urine may start a bed sore, and a circular air cushion, the center serving to collect and convey away the urine, is useful for either sex. He expatiates on the importance of copious drinking in the early stages of hypertrophy of the prostate, and with a good urinal this can be done, and proves very beneficial, especially when a mild suitable mineral water is used.

Postgraduate Course on Disease of Urinary Apparatus.—This supplement contains thirteen lectures by various urologists from the 1922 course at Wildung. About every aspect is represented. Some of the lectures have been published elsewhere and reviewed in these columns. Schlayer gives a table of the various forms of the three main groups of kidney disease (inflammatory, noninflammatory and vascular), listing under fourteen headings the findings to be expected in each of the total twenty forms. Voelcker says that those long accustomed to the catheter are less liable to inflammatory complications from an operation than with a virgin bladder. Sometimes permanently draining the bladder through the anterior wall will answer every purpose. This does not have the disadvantages of a retention catheter in the urethra, if the catheter fits too tight for any seepage. Urine is voided by merely removing the glass stopper.

Zentralblatt für Chirurgie, Leipzig

50: 985-1016 (June 23) 1923

Operative Treatment of Hallux Valgus. I. Wymer.—p. 986.
*Vaccinotherapy in Cystitis. A. Baer.—p. 987.
Operative Procedure in Rachitic Curvatures. O. Orth.—p. 989.
Indications and Mode of Action of Periarterial Sympathectomy. E. Makai.—p. 991.
Operation on Rectal Fistula. L. Kirchmayr.—p. 993.
Idiopathic Cyst in Common Bile Duct. L. Adam.—p. 997.
*Choledochoduodenostomy for Drainage. A. Jurasz.—p. 1000.

Vaccine Therapy in Cystitis.—Baer recounts the results in cystitis and pyelocystitis, associated with a partially paralyzed state of the bladder, following injuries or disease that temporarily affected the spinal cord. There were also some cases of postoperative cystitis following prostatectomy by the Freyer method. The latter cases are often of a very stubborn type, in which all forms of therapy prove ineffective. Also in Baer's cases the customary treatment with internal bladder disinfectants and bladder lavage brought little improvement. He therefore gave up all internal and local treatment and applied exclusively autogenous vaccine therapy. In the majority of cases there was a mixed infection of *Bacillus coli* with staphylococci or with diplococci. In the preparation of the vaccines, cultures were taken from every case, and after rinsing them in physiologic sodium chlorid solution, they were killed at a temperature of 65 C. and were made stable by adding 1 per cent phenol solution. Four solutions of varying content were prepared, ranging from 5 to 25 million killed bacilli per cubic centimeter. The injections were made according to the degree of inflammation of the bladder, at various intervals, usually every two or three days; the course of treatment covered about five weeks. Soon after the first injection, substantial improvement was noted; the urine became clearer; the pain during micturition decreased, and the number of bacteria in the urine diminished. The general health also improved greatly. There were no unpleasant secondary effects. Only rarely was a transient elevated temperature noted (38.5 C.). No impairment of kidney function was observed. In a few especially refractory cases, after an interval of six weeks, another course of treatment was given, which then was entirely successful.

Choledochoduodenostomy for Drainage of the Lower Biliary Passages.—Jurasz points out that the results of gallstone surgery are not always entirely satisfactory, since, not infrequently, patients are operated on too late, when the disease has already involved the lower biliary passages, and the operator, making an incorrect estimate of the condition, is content to do a simple cholecystectomy. Likewise, in the presence of calculi, inflammation and stasis in the common bile duct, drainage of the hepatic duct must be admitted, in many cases, to be insufficient to effect a lasting cure. Jurasz recommends, when the lower biliary passages are involved, a method which has not the disadvantages of Kehr's drainage of the hepatic duct and which guarantees a lasting cure; namely, anastomosis between the choledochus and the duodenum. He uses this method routinely in all cases in which he formerly would have employed drainage of the hepatic

duct. He describes his technic in detail. He has used the method in thirty-five cases, one of which resulted fatally, eight days after the operation, from cardiac weakness. The results have been otherwise excellent; in not a single case have the symptoms reappeared, nor has a secondary operation ever been necessary.

Zentralblatt für Gynäkologie, Leipzig

47: 897-944 (June 9) 1923

*Serodiagnosis of Syphilis. Handorn and Georgi.—p. 898.
*Effect of Typhus on Genital Functions. Weissenberg.—p. 904.
Diagnosis of Recent Extravasation of Blood After Rupture of Extra-Uterine Pregnancy. Piskacek.—p. 920.
Isolated Spastic Paralysis in the New-Born. Strochm.—p. 922.
Operative Treatment of Sterility in Women. Steinbüchel.—p. 929.
Soft Parts in Narrow Pelvis as Hindrance to Delivery. Frommer.—p. 932.

Serodiagnosis of Syphilis in Pregnancy, Childbirth and Puerperium.—Handorn and Georgi refer to the appearance in recent years of several articles in which the reliability of the Wassermann test during pregnancy has been strongly questioned, because frequently a positive reaction has been obtained in the case of women who clinically and in their past history gave no evidence of syphilis. It was assumed that the serum of the pregnant in itself was capable of bringing about a positive Wassermann reaction, as is the case in malaria, occasionally also in scarlet fever, and in certain stages of highly febrile affections. The writers feel that the serodiagnosis of syphilis is of exceedingly great importance in obstetrics and that the question of the reliability of the Wassermann test cannot be taken too seriously. Not only the well-being of the mother but also of the child depend in great measure on the early recognition of syphilis during pregnancy. By means of an antisyphilitic treatment begun at the proper time and carried through in the light of modern knowledge, it is possible to affect the health of the child, so that in a large percentage of cases such children are born in a healthy condition. Also during the puerperium, syphilis in the mother, when diagnosed, should receive energetic treatment. It is an established fact that, during arsphenamin treatment applied to the mother, arsphenamin is brought to the child in the mother's milk. They examined in their series 154 clinically healthy women, in part, at intervals during pregnancy, but also during childbirth and the puerperium. Of 78 healthy women whose blood (from the brachial vein) was examined, only two gave a positive Wassermann reaction (the same two women gave also a positive Sachs-Georgi reaction). Of 158 women examined during the puerperium, only two gave a positive reaction. Handorn and Georgi argue, therefore, that the serodiagnostic test of syphilis with blood from the brachial vein is entirely reliable in pregnancy, childbirth and the puerperium.

Effect of Typhus and Relapsing Fever on Menstruation, Pregnancy, Childbirth and Lactation.—Weissenberg has investigated 336 cases, most of which he observed personally in Ukraine. He concludes that typhus and recurrent fever cause no gynecologic affections and leave especially the endometrium unattacked, for which reason menstruation during the illness, as well as afterward, follows a normal course for the most part; uterine hemorrhages, at least, seldom appear, though more frequently with recurrent fever than with typhus. After recovery, in about a third of the women amenorrhea occurs for a short time. The fever process seems to have a cleansing effect on the organs of reproduction, and, as a consequence, conception soon occurs. The temperature of the patient and the violence of the case are in no wise connected with the course of menstruation, pregnancy and childbirth.

Journal of Biochemistry, Tokio

1:333-515 (July) 1922. English and German Edition

*Carbohydrate Metabolism on Protein-Fat Diet. N. Kageura.—p. 333 and p. 389.
Nitrogenous Elements of Fruit of Sechium Edule. K. Yoshimura.—p. 347.
*Chemistry of Tubercle Bacilli. R. Koganei.—p. 353.
The Prolamin of Grain, Coix Lacryma L. G. Hattori and S. Komatsu.—p. 365.
*Alimentary Hyperglycemia. K. Sakaguchi et al.—p. 371.
Bactericidal Action of Colloidal Silver. M. Kusunoki.—p. 381.
Effect of Presence of Electrolytes on Turbidity Point of Albumin Solution. S. Kakiuchi and S. Koganei.—p. 405.
Solubility of Globulin in Neutral Salt Solution. K. Kodama.—p. 419.
Protective Colloids of Milk. T. Tadokoro and S. Sato.—p. 433.
Influence of Vitamin B on Digestive Function. S. Tsukiye and T. Okada.—p. 645.
Research on Glycolysis. C. Aihara.—p. 457.
*External Temperature and the Blood Sugar. M. Taya.—p. 479.

Influence of Protein and Fat on Carbohydrate Metabolism.—The power of assimilating carbohydrates was reduced, Kageura announces, in twelve persons and in a number of dogs on a diet of predominantly protein and fat. Addition of proportional amounts of carbohydrates reduced this deleterious action of the protein and fat.

Chemistry of Tubercle Bacilli.—Koganei denies that fatty substances are responsible for the acid-fast staining property of tubercle bacilli. He ascribes this to kephalin alone.

Alimentary Hyperglycemia.—In Japan in the healthy, on an ordinary diet, the sugar content of the blood often runs up to 0.15 per cent. after eating, and sometimes much higher. Glycosuria may occur likewise, but this is rare.

Influence of External Temperature on Sugar Content of the Blood.—The research was done mainly on rabbits. The season does not seem to influence the sugar content of the blood, but heating increases it. The maximum is reached in from two to four hours, and then it declines to normal or below for a few hours.

Hospitalstidende, Copenhagen

66: 441-456 (June 20) 1923

*Tricuspid Stenosis. A. Oigaard.—p. 441.
*Theories on the Light-Bath Therapy. P. Schultzer.—p. 447.

Stenosis of the Tricuspid Valve.—Oigaard, in 1915, diagnosed the disease of a woman, aged 30, as tricuspid stenosis, from cyanosis with red, scale-covered spots, emaciation, dyspnea, dry skin, short systolic and long diastolic murmurs, arrhythmic pulse with a rate of 48, blood pressure 120, and ascites. He prescribed salt-poor diet, two hours rest at noon, and digitalis. The heart symptoms disappeared, the pulse became regular, at 56, and she resumed teaching in four months, but developed cardiac cirrhosis, two months later, with ascites so pronounced that paracentesis yielded 12 liters, twice a month, for which a resultless operation, under anesthesia, was performed the following year. She yielded 1,000 liters, in sixty tappings, and died, in 1922, from acute bronchitis with fever and acute inflammation of the middle ear. Necropsy showed enormously enlarged, pale and dry heart, with pericardial adhesions, and brown lungs. He found only ten or twelve cases of pure tricuspid stenosis, confirmed by necropsy, in the literature, and only 100 with mitral complications.

Theories on Light-Bath Therapeutics.—Schultzer says that the old theory of the chemical importance of the short-wave rays in light-bath therapeutics is questioned at the Finsen Institute, and he considers "chemical rays" a misleading term for the violet and ultraviolet rays since they do not always on absorption produce chemical changes. Besides, living protoplasm is injured by irradiation with this light. The carbohydrate synthesis in green leaves is a photochemical reaction caused by the visible rays in the yellow field of the spectrum, by light as such. The visible rays, because of their great penetrative power, reach the tissues directly and the blood is heated through absorption. Reyn sees a more rapid effect when the light-bath is dosed to produce strong erythema with subsequent scaling.

66: 473-488 (July 4) 1923

*Central Fixation and Optic Nystagmus. G. V. T. Borries and A. A. Meisling.—p. 473.

Optic Nystagmus and Central Fixation.—Borries and Meisling say that there is peripheral as well as central fixation and the definition which limits the holding of the sight impression to the fovea is misleading. The production of optic nystagmus is not connected with scotoma of any particular part of the field of vision. As the nystagmus can be produced when all power of sight is lost, and from any part of the field of vision, it must be considered one of the fundamental functions of the eye.